PUBLISHERS LAW BOOKS
PRINTERS AND BOOKBINDERS
The Carswell Company
TORONTO

Digitized by the Internet Archive
in 2014

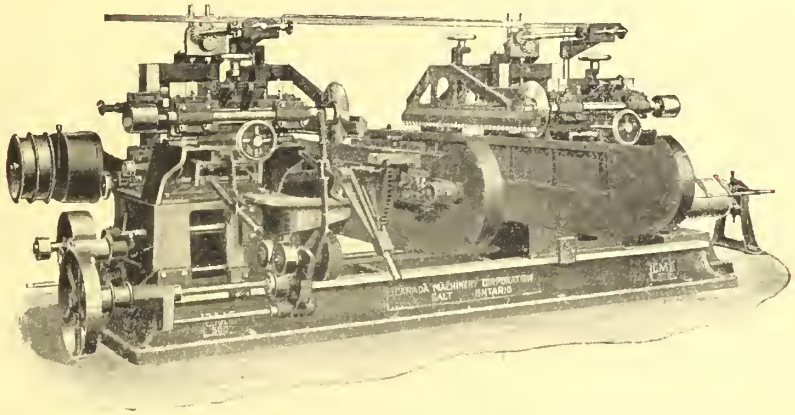
https://archive.org/details/canadianwood22

Volume Twenty-Two TORONTO, JANUARY, 1922 Number One

CANADIAN WOODWORKER and Furniture Manufacturer

C.M.C.

"THREE DAYS IN THREE QUARTERS OF AN HOUR"



No. 500 Double End Tenoner

One "500" user says "I have just done in three quarters of an hour what used to take me three days".

Little wonder this factory is giving its competitors cause for worry.

You can do the same on the "500".

Full Description on request

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721 Bank of Hamilton Building

The Stamp of Efficiency

The Symbol of Service

SOLID LEATHER

The Mark of Economy

The Sign of Dependability

D. K. McLAREN

Limited

Head Office and factory
351 St. James St. Montreal

TORONTO
194 King St. West

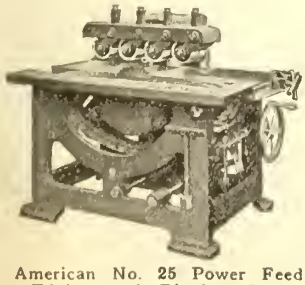
VANCOUVER
334 Cordova St. West.

ST. JOHN, N. B.
90 Germain Street

PARTIAL LIST OF A 1 BARGAINS
IN WOODWORKING MACHINERY

Some new—others practically so—all at very attractive prices. We have many others
If you don't see what you need listed, ask us for particulars

1—Used Double Dowel Machine,
1—Used Bowmanville 4" Sash Sticker,
3—Used Machines for turning Mouldings,
1—Used Cowan Door Relisher
1—Used McGregor-Gourlay Door Clamp,
1—Used Sturtevant 36" Single Fan
1—Used " 45" Double Fan
1—Used " 48" Single Fan
7—Used Bowser Tanks,
1—Used Double Spindle Boring Machine,
1—Used Kelley Router,
1—Machinery Co. of American 5' Back Gauge,
1—Used American No. 2½ Tenoner,
1—Used Ballantine, Two Spindle Shaper,
1—Used C.M.C. No. 438 Arm Sander,
1—Used C.M.C. No. 507 Power Chisel Mortiser,
1—Used Preston 36" Band Saw.
1—Used Preston No. 127 Variety Saw Bench,
1—Used Preston No. 121 Pony Planer, 24"
1—New American No2. Disc and Spindle Sander,
1—Used Oliver No. 8 Wood Trimmer,
1— " Cowan 13" Four Side Moulder,
1— " Cowan M-277 32" Automatic Knife Grinder,
1— " Single Spindle Vertical Boring Machine
1— " Post Borer,
1— " Jackson-Cochrane Power Feed Rip Saw,
1—New American No. 30 Universal Saw Bench,
1— " " No. 25 Edging and Ripping Saw,
1— " " No. 3 Double Cut-off Saw,
2—Used American No. 229 9" Hardwood Planer and Matchers
1—Used American No. 22 Four Side Moulder,
1— " Hespeler, 10" Four Side Moulder,
1— " Houston 8" Four Side Moulder,
1— " American No. 2 Hand Feed Rip Saw,
1— " American 36" Double Disc Sander,
1— " Berlin 36" Three Drum Sander,
1—Used American 24" Jointer with power feed attachment.
1— " Dodds 10 Spindle Dovetailer,
1— " Reynolds Screw Driver,
1— " Covel No. 40 Automatic Saw Sharpener,
1— " Cowan 10" Four Side Moulder,
1— " Francis 24" Glue Spreader,
1— " Jackson-Cochrane Chair Seat Former,
1— " Four Spindle Horizontal Boring Machine,
1— " Knob Turner,
4— " Embossing Machines for mouldings
1— " Goldie-McCulloch Two Spindle Shaper
1— " Goldie-McCulloch Dowel Sticker,
1— " Revolving Bed Planer, 24"
1— " Cant-Laidlaw 8" Four Side Moulder,
1— " Cant-Gourlay 8" Four Side Moulder
1— " McGregor-Gourlay Small Self-feed Rip Saw
1— " Crescent Small Rope Moulding Machine
1— " Arm Sander,
1— " Goldie-McCulloch Single End Tenoner,
1— " Cameron & Co. Single End Tenoner,
1— " Cowan Horizontal Chisel Mortiser,
1— " Jenkins Veneer Jointer,
1— " Preston Veneer Taping Machine,
3— " Veneer Lathes, 130", 88", 54",
Swing Cut-off Saws,
Veneer Clippers,
1— " Beach Double Cut-off Saw,
1— " Box Ripping Saw Table,
1— " Elliot No. 5 Woodworker,
1x— " Merritt Re-driers,
Vegetable Glue Mixers,
Hydraulic Press,
1— " 54" Band Resaw
1— " Yates 49" Endless Bed Planer
1— " Roller Table Belt Sander
1— " Yates Double Cut-off Saw
" Variety Saw Tables,
" Universal Saw Tables and many others.

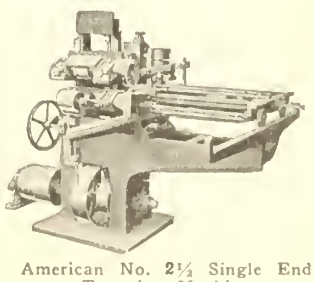


American No. 25 Power Feed Edging and Ripping Saw

Garlock
Machinery Co. Limited
163 Dufferin Street

WINNIPEG TORONTO MONTREAL

Everything in Woodworking and Metal Working Machinery



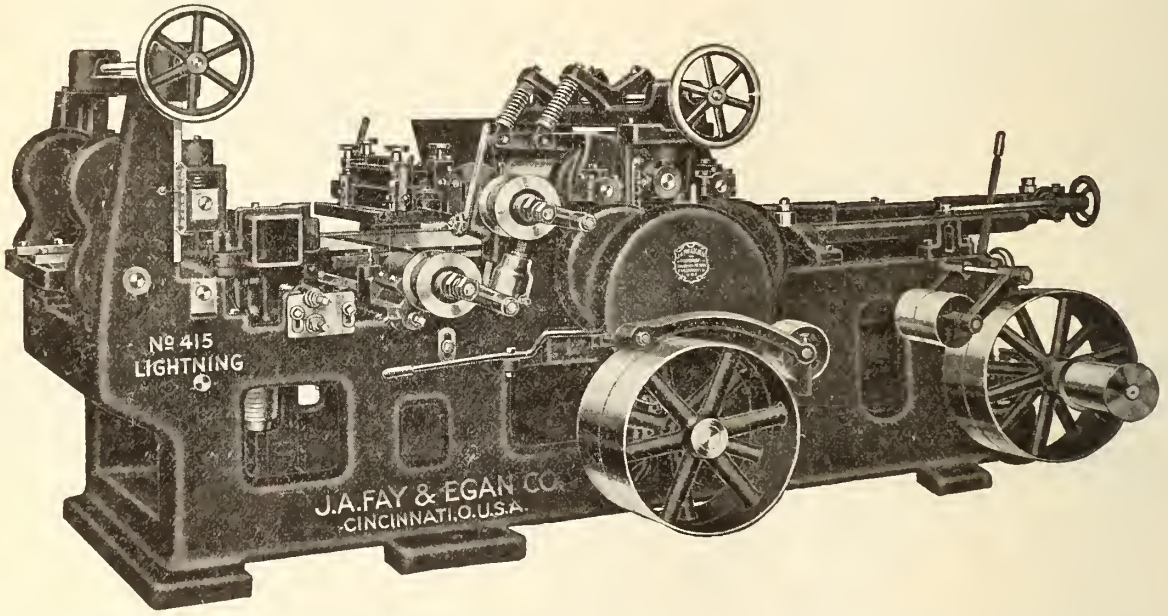
American No. 2½ Single End Tenoning Machine

The Class of Work a No. 415 Will Do Is Beyond Criticism

The greatest general purpose Planer, Matcher and Molder presented to the woodworking industry in years.

Made in Three Sizes, 16″, 20″, 24″ wide and 8″ thick.

No.415 has successfully met the requirements of Planing Mills and other woodworking plants for working hard and soft woods.



No 415 "Lightning" Fast-Feed Double Cylinder Planer and Matcher

Each belt has Gravity Tightener for taking up stretch.

Write for Bulletin C-11 for additional information.

No. 415 is easily accessible for all adjustments and for setting up, saving much valuable time every day.

"The Lightning" Line
TRADE MARK REG.

It will not tear out or raise the fuzz on knotty or cross-grained stock. First costs and operating expenses are well within the reach of any mill owner.

J. A. Fay & Egan Company

Established 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St., CINCINNATI, OHIO

Yates

Yates

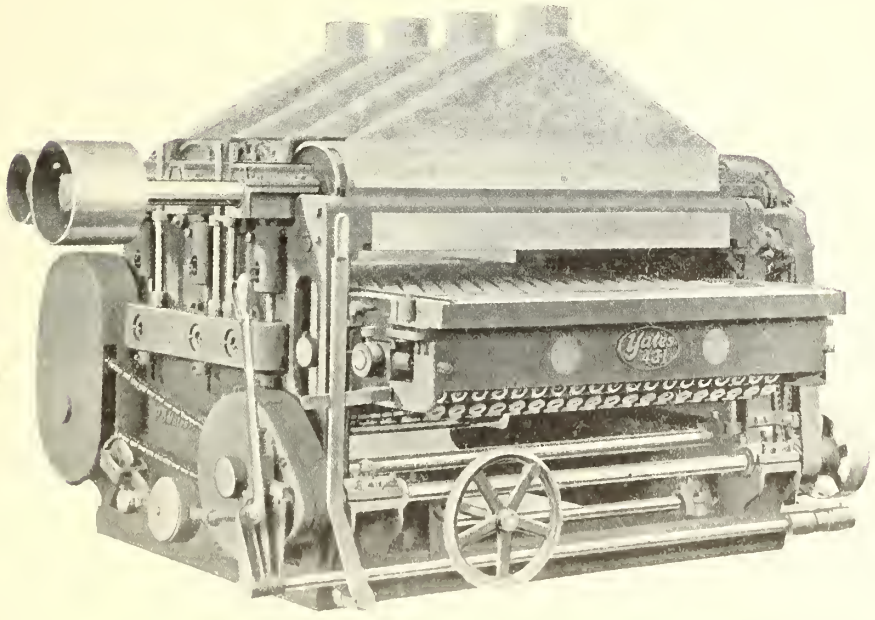
The only machine made in which the sandpaper on the drums can be tightened up at each end independently or both at the same time, also should the paper become loose it is automatically tightened while machine is in operation.

That machine is Yates No. 431 Endless Bed Sander, a machine that is especially adapted for sanding narrow and short stock. Of course it will handle the big stuff as well and give an excellent fine finish.

It will take stock short as 3 inches and thin as ¼ inch which can be automatically fed by the endless bed. Built in three sizes 31-43-49 inches wide.

Our Sander-Book explains this fully and we will gladly send you one for the asking

P. B. Yates Machine Company Ltd.
HAMILTON, ONT. CANADA



YATES

MAPLE LEAF SAWS

Maple Leaf Saws will give you just that steady, day-in-day-out service that means so much in your plant. They are made with this object in view. The whole process of their manufacture, from the selection of the highest grade steel to the time they leave our hands is attended to with the greatest care.

The complete line includes Bands, all kinds of Special Saws for Special Work, Cross-cut Saws, Gang Saws, Dado Heads, etc. Every one guaranteed to merit your approval.

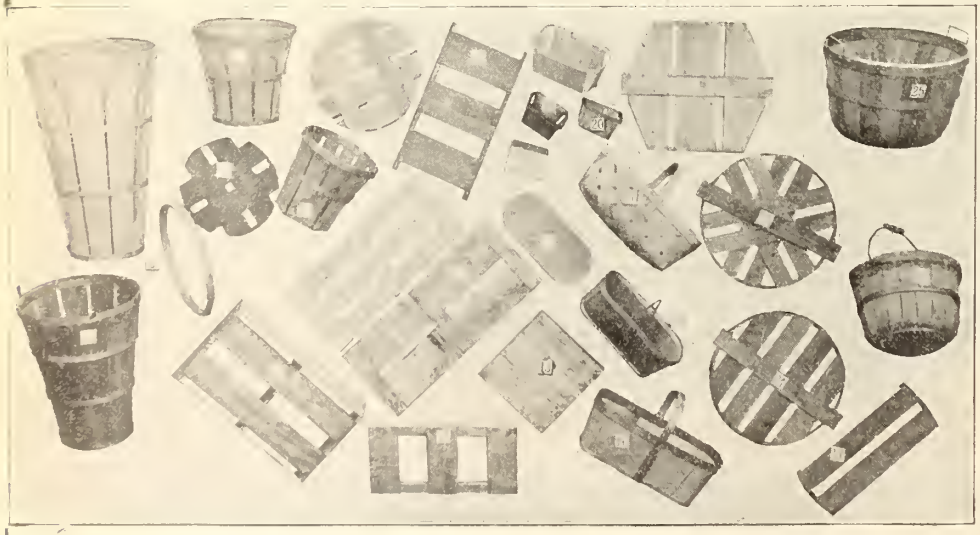
Write for a copy of our catalogue.

The Largest All-Canadian Saw Manufacturers

SHURLY - DIETRICH, LIMITED, GALT, CANADA

Store and Repair Branches at Vancouver and Ottawa

THIS IS THE NAME



of the Machinery for the Rapid Production of

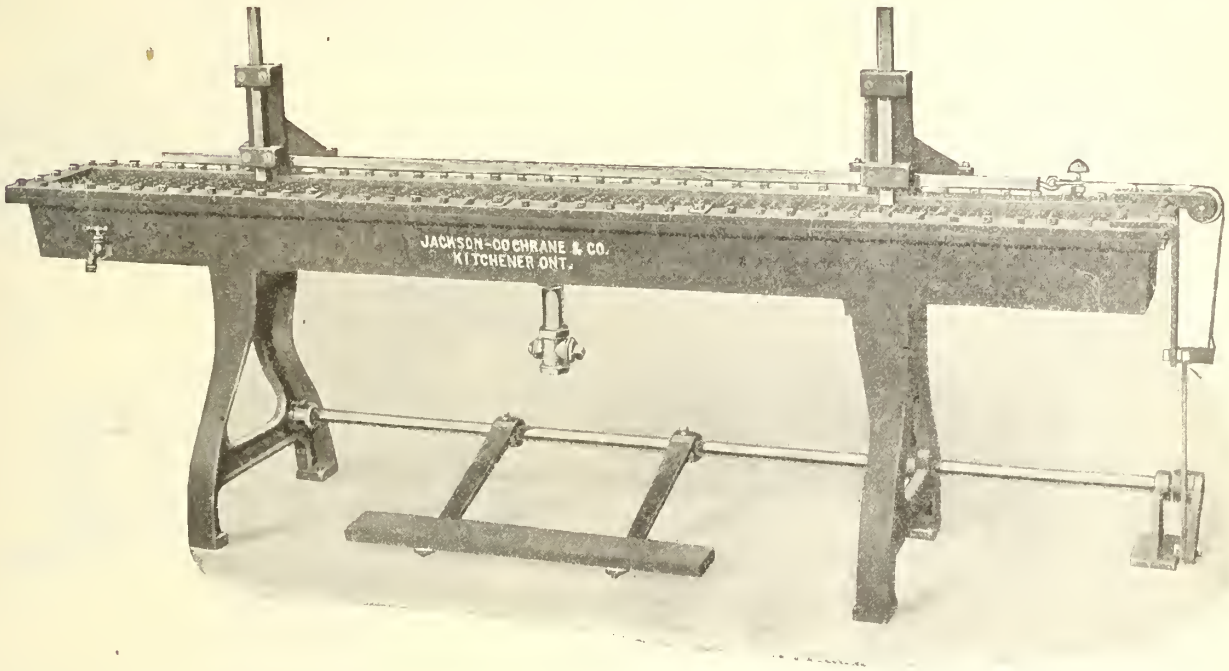
Veneer—Crates—
Baskets—Fruit Packages.

"ST JOE"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

A NEW PLATE JOINT GLUE SPREADER



YOU CAN DOUBLE THE PRODUCTION OF YOUR GLUE CLAMPS WITH THIS NEW MACHINE

A thoroughly tested and tried machine that operates easily without waste or mess. It will more than double the production of your clamping equipment. This was proven when it was recently given a thorough trial in one of the largest furniture factories in the Dominion.

The method of operation is simple. The operator presses the foot lever down, forcing the perforated plate up out of the glue. Then by resting the edges of the stock on the plate and moving them backward or forward about one inch, the edges resting on the plate will be instantly and completely spread with glue. On releasing the foot lever the plate is lowered into the glue ready for the next batch of stock.

The tank is 5″ wide and 5″ deep.
Perforated plate is 4″ wide, $\frac{3}{8}$″ thick and 1″ shorter than tank.

Size	Floor Space	Weight
5′ 11″	7′x2′	700
7′ 11″	9′x2′	800

Descriptive Circular sent on request

JACKSON, COCHRANE & CO., KITCHENER, ONT.

Does the work better, in one-third the Time

Here is what the largest manufacturer of kitchen cabinets says of Reynolds Automatic Magazine Fed Screw Driving Machines: "Used Reynolds five years. Given excellent satisfaction. Saves original cost many times over."

And the largest suction sweeper company in the world writes.—"Our two Reynolds not only save us from six to eight men, but in addition do better work than we could expect to have done by hand."

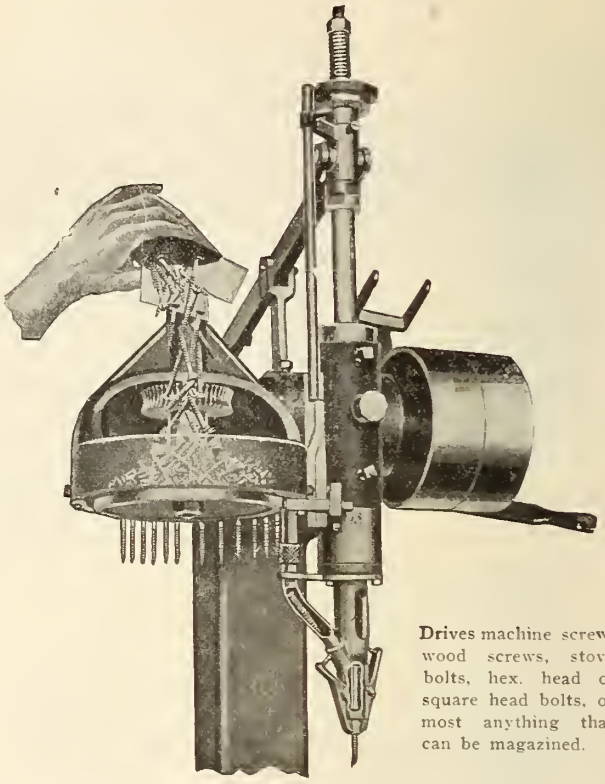
Since writing the above, both these companies have purchased additional machines.
Could you want any stronger evidence of the efficiency of the Reynolds?

Send us dimensions over all of your work and gauge and length of screws driven so that we can determine the proper size and type machine to meet your requirements.

The Reynolds Machine Co.

Department C.

Massillon, Ohio, U.S.A.



Drives machine screws wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.

The Handiest Machine on the Market

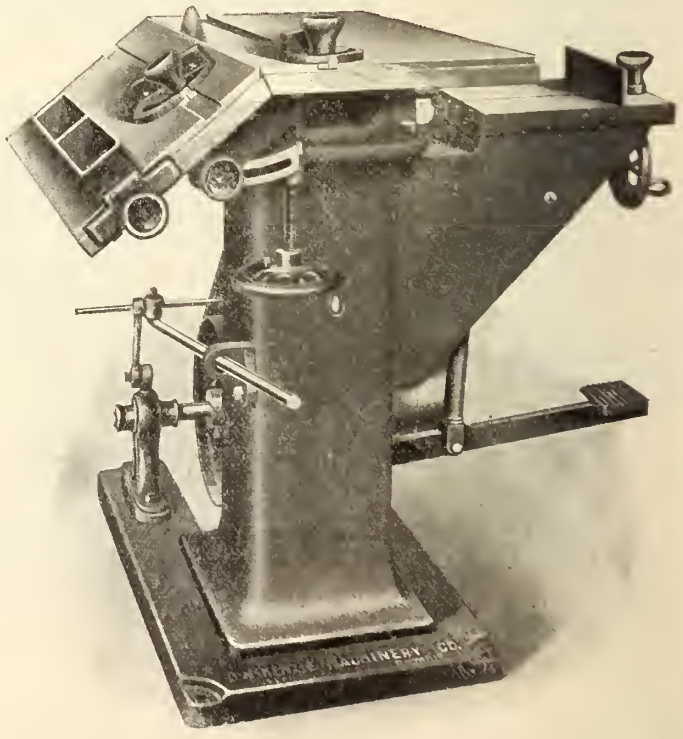
The Split-tilting table (Patent Applied For) can be tilted and locked at any angle up to forty-five degrees as indicated on the graduated segment. This machine is also supplied with a solid table. The Boring Attachment is very complete in itself. A foot lever is connected with the table which slides back and forth on the knee. A large coil spring located in the column of the machine automatically releases the work from the bit when pressure is removed from the foot lever. The Boring Attachment is raised or lowered by means of a handwheel connected with a pair of mitre gears. The spindle is bored to take standard size bits and can be arranged for a hollow chisel mortiser. Special cutters may be used by removing the throat in the table. Each machine is furnished with one ten inch saw, belt and wrench.

Write for prices and phamphlet describing this time and labor saver more fully.

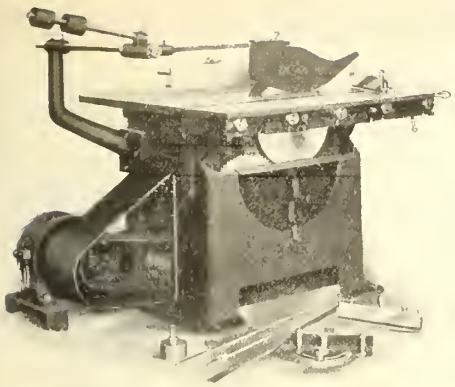
D. McKenzie Machinery Co.

MANUFACTURERS

GUELPH, ONT. CANADA



Cross-cut Mitre & Rip Saw Machine showing Split-Tilting Table & Boring Attachment



"Oliver No. 60 Universal Saw Bench"

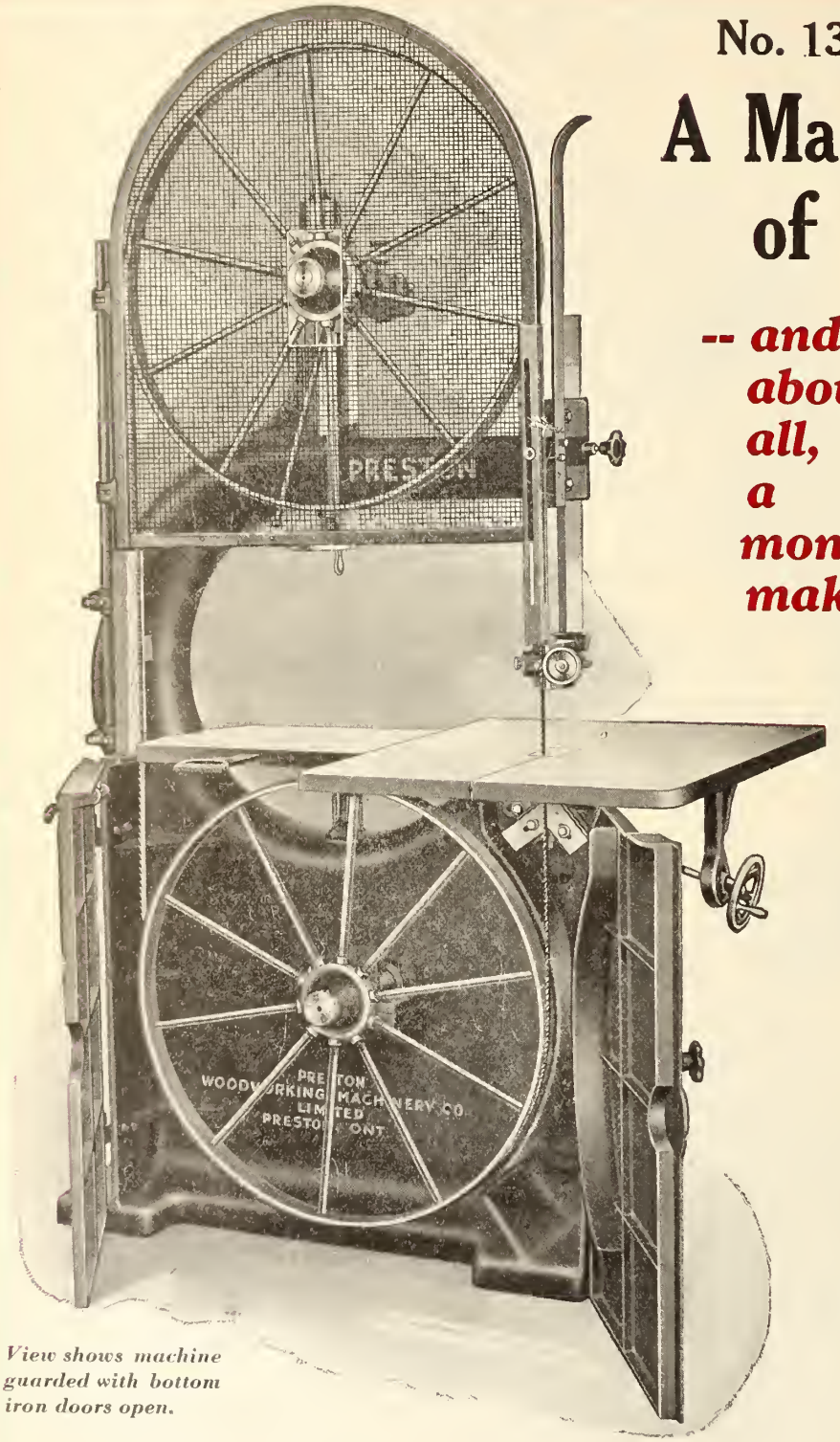
"Oliver" Universal Saw Benches

with their two arbors, one carrying a rip saw, the other a cut off saw have been exceedingly popular tools for many years. They have now been developed to a very high state of effeciency and safety. If you are not already familiar with these saw benches better send for full description.

The name "Oliver" is associated with the word "Quality" in connection with—

WOOD WORKING MACHINERY

The Oliver Machinery Co. is jealous of its reputation in this regard and is careful to build tools that match up to their claims of superiority.



View shows machine guarded with bottom iron doors open.

No. 132—36″ Band Saw

A Machine Worthy of Your Plant

-- and above all, a money maker

If this machine had been constructed to your own specifications we believe you could not be better pleased. Nothing is lacking either in design, materials or workmanship. It is the best machine money and brains can produce.

A few of the special features we might mention are the construction of the wheels (all steel with solid rubber bands 1/4 in. thick), the one piece frame, convenient adjustment, universal alignment of wheels and steadiness in running and the almost perfect tension device and style of guide. This last feature reduces the breaking of saws to the minimum. S. K. F. Ball bearings in upper and lower wheels if desired.

It will be a pleasure to forward details

The Preston Woodworking

Specialists in Ball Bearing Woodworking Machinery

We are the Sole Manufacturers and Agents in Canada of the Eaglesfield Patented Beltless Swing Saw—See advertisement page 17

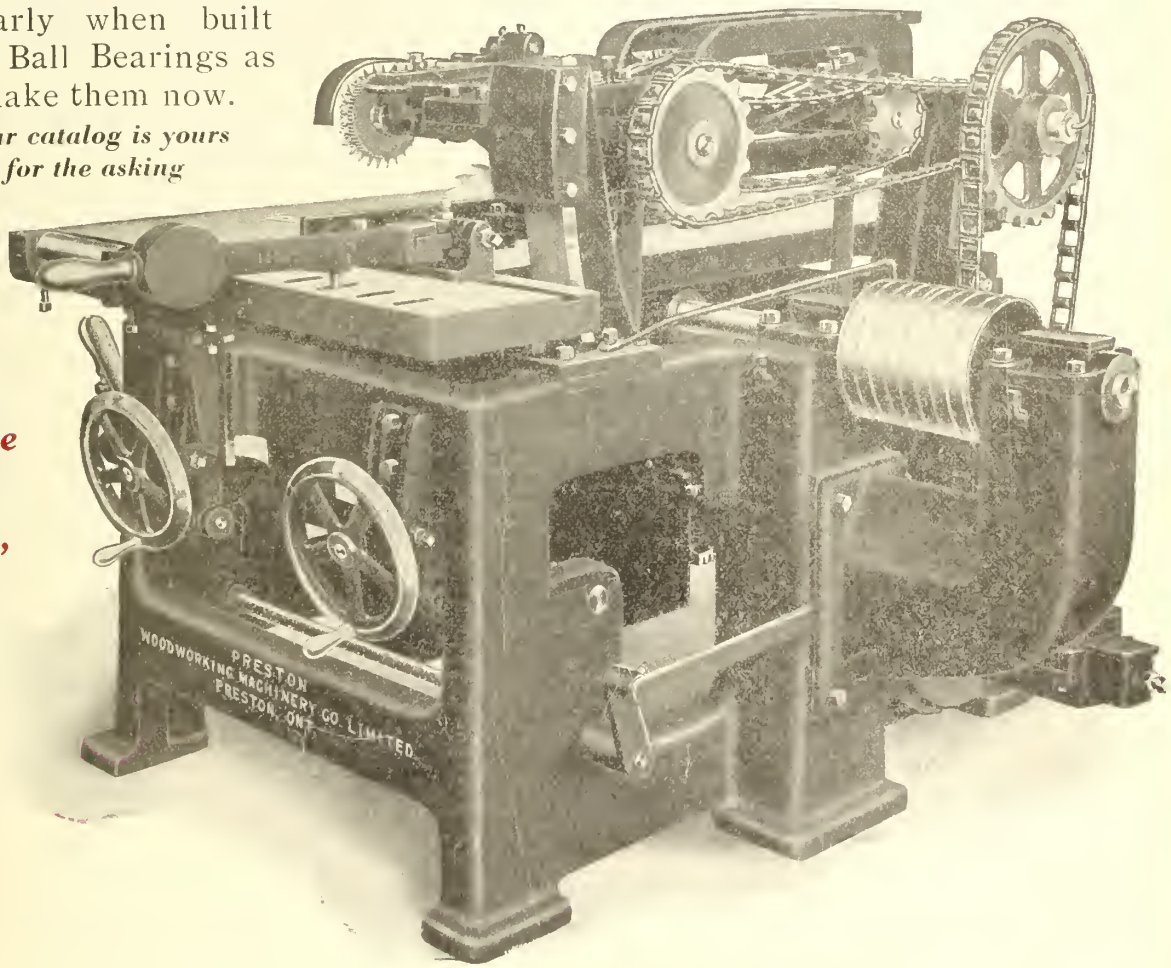
Power Feed Rip Saw

"Preston" No. 129

In this machine it is interesting to note that the frame is one solid casting, that each bearing is self-oiling, that both table and upper works are adjusted by hand wheels and that the feed is variable from 0 to 240 feet per minute and reversible. In fact, an inspection of this machine from end to end would reveal the unusually careful attention to detail which characterizes every "Preston" machine.

As a labor saving and production increasing device it is not exceeded by any other make, particularly when built with Ball Bearings as we make them now.

Our catalog is yours for the asking



"Treat Your Machine as a Living Friend"

Machinery Company, Ltd.

PRESTON, ONTARIO

Alphabetical List of Advertisers

Adjustable Clamp Co. 106
Algoma Panel Co. 85
American Hardwood Lumber Co. 27
American Walnut Mfrs. Association 22
Anderson, Shreiner & Mawson 35
Anderson Tully Co. 97
Arbuthnot Lumber, Sash & Door Co. 17
Arkla Lumber Co. 38
Atlantic Lumber Co. 46
Atlas Mfg. Co., of Orlando 107
Atkins & Co., E. C. 119
Ault & Wiborg Co. 73

Bachman Co., F. M. 81
Batavia Clamp Co. 106
Banning, Leland G. 26
B. C. Lumber Commission 27
Bigelow-Cooper Lumber Co. 30
Barlett Lumber Co., W. C. 42
Barr-Holaday Lumber Co. 43
Birds Eye Veneer Co. 74
Black Bros., Co. 105
Bonner & Sons, J. H. 32
Brantford Pattern Works 115
Bruce Co., E. L. 41
Bruce Woodworkers 34
Buffalo Hardwood Lumber Dealers 36
Bury & Co., Robt. 46

Calhoun Plywood Co. 110
Canada Machinery Corporation 1
Canada Wood Specialty Co. 40
Canadian Blower & Forge Co. 20
Canadian General Lumber Co. 99
Canadian Nashua Paper Co. 20
Canadian Powers Regulator Co. 17
Canadian S. K. F. 113
Carborundum Co. 111
Carter & Co., E. T. 67
Casein Mfg. Co. 19
Central Veneer Co. 80
Chapman & Dewey Lumber Co. 40
Chattanooga Machinery Co. 115
Chicago Mirror & Art Glass Co. 110
Clamp Nail Co. 110
Coignet Chemical Products Co. 108
Colborn, C. B. 28
Comfy Cushion Co. 68
Cowan & Co. 16

Darnell Love Lumber Co. 103
Delany & Pettit Limited 68
De Vilbiss Mfg., Co. 72
Doon Twines 68
Dry Kiln Door Carrier Co. 105

Eagle-Ottawa Leader co. 67
Eaton & Sons, J. R. 35
Engineering & Machine Works of Canada Ltd 118
Empire Tool Works 106

Farquhar, A. B. .....
Fay & Egan Co., J. A. 4
Fibro Mfg., Co. 26
Foster, Merriam Co. 21
Freiberg Mahogany Co. 77
Frye Lumber & Veneer Co., J. W. 79

Gall Lumber Co. 99
Garlock Machinery Ltd. 3
General Machinery Co. 115
General Hardwood Lumber Co. 32
Globe Vise & Truck Co. 105
Grand Rapids Vapor Kiln 109
Gulf Lumber & Trading Co. 24

Hafner Mfg. Co. 22
Hartzell, Geo. W. 31
Hay & Co. 91
Hay & Co., Peter 109
Hewit Lumber Co., D. E. 42
Heeney, Percy E. 35
Hoffman Bros., Co. 80
Hyde Lumber Co. 32

Ideal Coated Paper Co. 38
Ideal Fence & Spring Co. of Canada, Ltd. .. 67
International Business Machines 93

Jackson, Cochrane & Co. 7

Kramer, John 20
Klotz Machine Co. 105
Kosse, Shoe & Schleyer Co. 34
Kraetzer-Cured Lumber Co. 95

Laidlaw Bale-Tie Co. 107
Litton Veneer Co. 79
Liverpool Hardwood Co., Inc. 39
London Lumber Co. 35
Long-Knight Lumber Co. 91
Luehrmann Hardwood Lumber Co., Chas. F. 27

Macdonald Norman .....

First Class Machines For Sale

Practically new type 2-G Yates Straight Edge Rip Saw, with a 10" saw, revolving bed.
Used McGregor Gourlay QY 15 x 6 Planer and Matcher. Thoroughly overhauled.
Practically New No. 112 Fay and Egan "Lightning" Flooring Planer, planes and matches 6" wide, 4" thick, 8 feed rolls. 40 HP required to operate.
New No. 162 Preston High Speed Ballbearing Shaper speed 7,000 revolutions per minute. Table 58 x 41, spindles 1-¼", 28" centres.
Used 24 x 6 Cowan Planer and Matcher, like Cowan No. 11, but the gears are not guarded.
Used No. 4½ 30" American Sectional Roll Cabinet Planer, a very fine surfacer, for cabinet work, in hard or soft woods,with sectional feed rolls and sectional chipbreaker.
Used Wysong and Miles type Belt Sander. In first-class condition.
New No. 143 Preston 10" moulder on base, fitted with slip on heads, variable feed. Latest design embodying all known improvements.
Used 42" Berlin Royal "Invincible" 3 drum Sander, with power raising rolls and spiral drums, with solid bed.
Used 48" Berlin "Invincible" three drum Sander, with spiral drums and hand power raising rolls.
Practically new 20" Preston Jointer, with round safety cylinders.
New 12" Preston Jointer with round safety cylinder.
New C.M.C. 12" Buzz Planer with round cylinder.
Used No. 177 30" Berlin Double Surfacer with divided rolls.
Used 26 x 10 McGregor Gourlay Double Surfacer, similar to C.M.C. No. 216.
New No. 10 Ober Lathe, for making, fork, hoe, broom, ice hook, tent poles, rods, etc.

The Prices are Right.

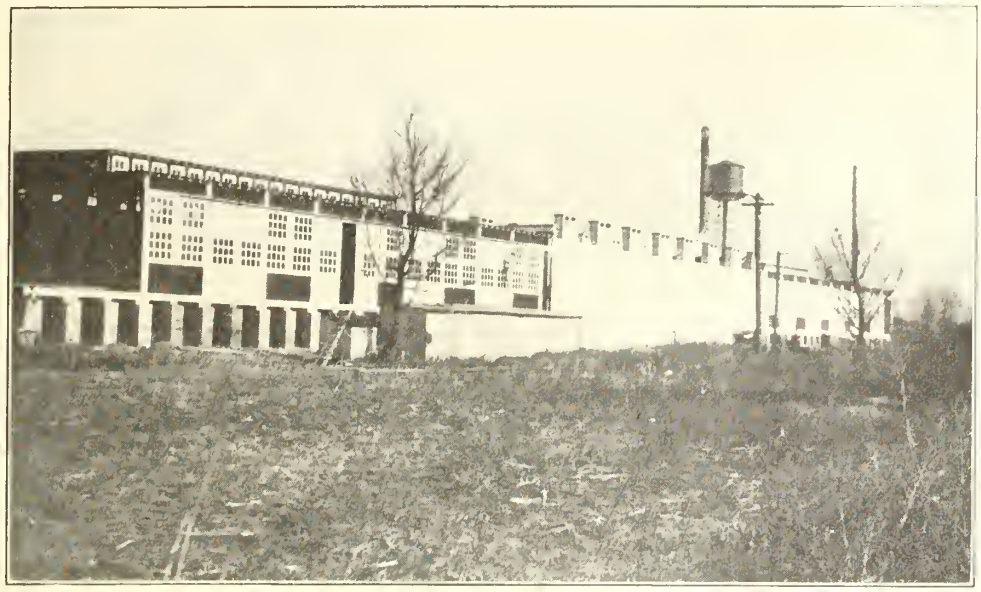
The A. R. Williams Machinery Co. Limited

64 FRONT ST. WEST - TORONTO

Phone Woodworking Machinery Dept., Adelaide 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractors' Machinery, Electric Motors, Saws, Shingle and Lath Mill Machinery, etc.

HALIFAX, N.S. ST. JOHN, N.B. MONTREAL, P.Q. TORONTO, ONT.
VANCOUVER, B.C. WINNIPEG, MAN.



DEPENDABILITY

Plus

RELIABILITY

Many a woodworker has been using

National Dry Kilns

for years

He could not be induced to change, because he has learned of their dependability. Week in and week out he has found that he can

Depend upon Nationals

to produce quality results

You can name any good qualities that any dry kilns have, and he will show you that these are also to be found in Nationals; and when you are through, he can mention additional features to be found **only in Nationals.**

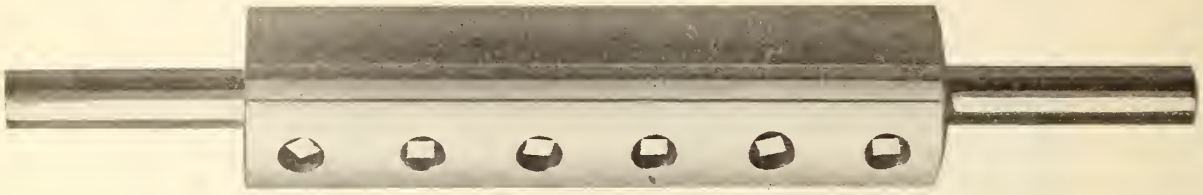
"The First Kiln in 6,000 years in which Humidity is Automatically Controlled"

THE NATIONAL DRY KILN COMPANY, 1117 East Maryland Street, Indianapolis, Indiana

C. A. FIELDS, Canadian Representative, P. O. Box 55, Toronto

NATIONAL DRY KILNS

The ShimerRound Safety Cylinder with High Speed Knives



A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

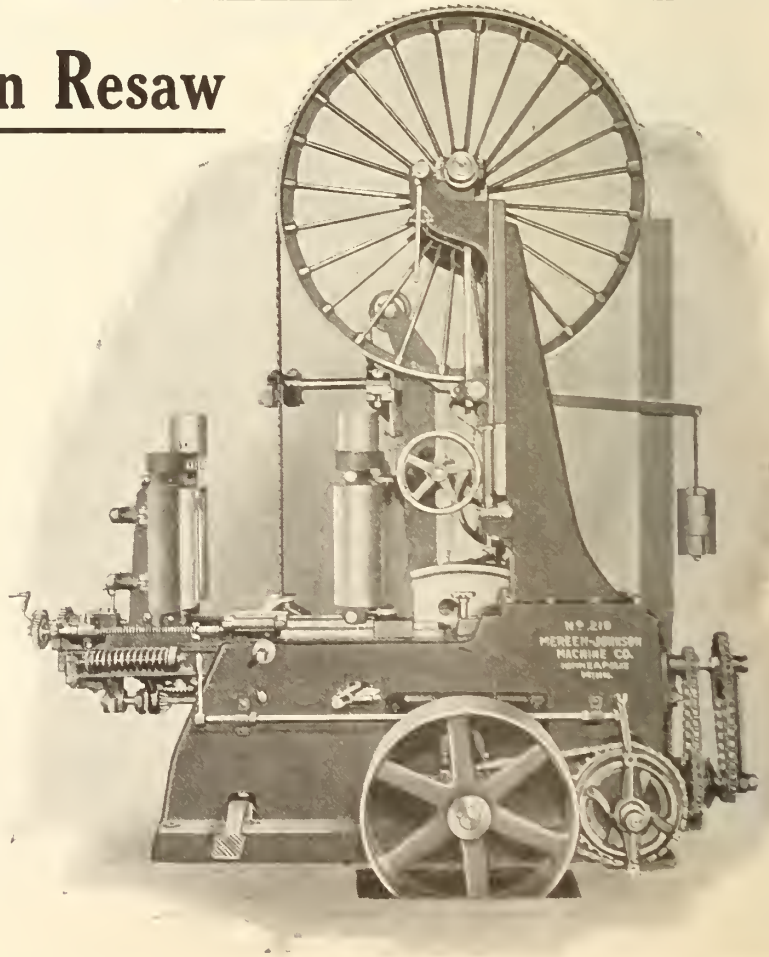
The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

No pulleys—no belts—no frictions.

The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

Write for circular.



Mereen-Johnson Machine Co.

Minneapolis Minnesota, U.S.A.

"Vulcanite Krome"

the latest achievement in belting tannage

is the belt for the difficult woodworking drives. It is more flexible, less stretchy, and far stronger than other belting. It practically eliminates slip. It is oil proof, steam proof and waterproof. It realy gives

BELTING SERVICE

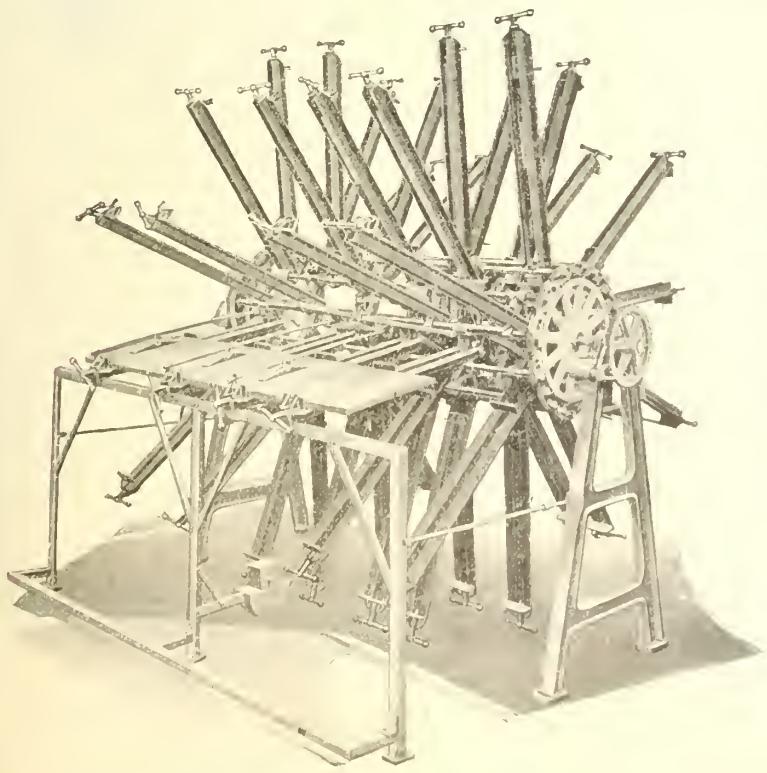
Its sure grip saves power.
Its long life saves costly breakdowns.
Its flexibility transmits the full power to the smallest pulley.

Quarter-turn belts made-to-order without extra charge

MECHANICAL LEATHERS LIMITED
64 Wellington St. West :-: Toronto

VULCANITE KROME IS THE BELT FOR THE WOODWORKER

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK

CLAMP CARRIER

for

Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42 in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.

Alphabetical List of Advertisers—Continued

Maley & Wertz Lumber Co. ... 23
Mattison Machine Works ... 120
May Hardwood Co., R. R. ... 27
Mcdonagh Lumber Co. ... 35
McKenzie Machinery Co., D. ... 8
McKnight & Son Co., L. G. ... 115
McLaren & Co., D. K. ... 2
McLennan Lumber Co., Limited ... 40
Mechanical Leathers, Ltd. ... 15
Mengel Co., The ...
Memphis Bandmill Co. ... 43
Memphis Veneer & Lumber Co. ... 80
Mercereau Hawkins Tie Co. ... 38
Mereen-Johnson Machine Co. ... 14
Merritt Engineering & Sales Co. ... 86-110
Miller Lumber Co. ... 23
Mohawk Veneer Co. ... 78
Morgan Machine Co. ... 117
Mowbray & Robinson ... 44
Munising Woodenware Co. ... 86
Murelle Lumber Co., L. D. ... 24

Nash, J. M. ... 100
National Hardware Co. ... 109
National Dry Kiln Co. ... 13
Neville-Cooper Co. ... 19
Nichols & Co., A. S. ... 72
Nichols & Cox Lumber Co. ... 28
Northwestern Cooperage & Lumber Co. ... 77

Oakey & Sons, John ... 107
Ober Manufacturing Co. ... 106
Ohio Veneer Co. ... 77
Oliver Machinery Co. ... 9
Otis Mfg Co. ... 37
Overton, S. E. ... 108

Paache Air Brush Co. ... 73
Palmer & Parker ...
Pedwell Hardwood Lumber Co. ... 34
Penfound Varnish Co. ... 73
Penrod-Jurden Co. ... 82
Penrod Walnut & Veneer Co. ... 82
Perkins Glue Co. ... 101
Perrin Ltd., Wm. R. ... 109
Petrie Ltd., H. W. ... 108
Pickrel Veneer Co. ... 83
Porter Machinery Co., C. O. ... 108
Preston Woodworking Mach. Co. ... 10-11
Purcell Walnut Lumber Co., Frank ... 44

Radcliff Saw Mfg. Co. ...
Reese-Sheriff Lumber Co. ... 24
Reynolds Machine Co. ... 8
Richards Hardwood Co. ... 28
Richards-Wilcox Canadian Co. ... 96
Rowe Mfg., Henry ... 107
Rush Lumber Co. ... 33

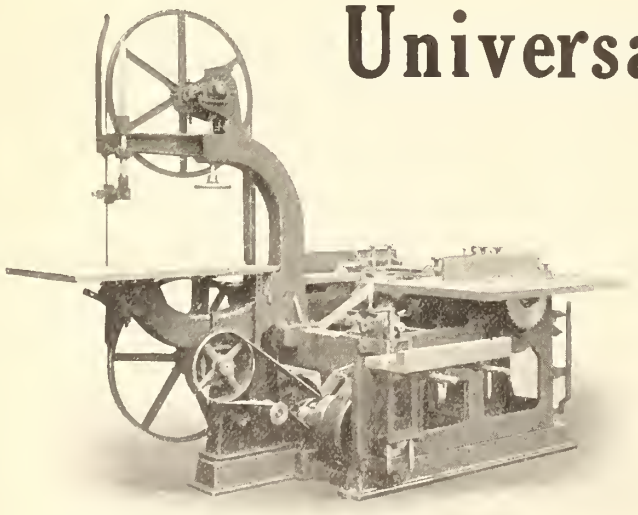
Shantz, P. E. ... 19
Shimer Cutter Head Co. ... 14
Shurly Dietrich Co. ... 6
Sidmans Limited ... 104
Simonds Canada Saw Co. ... 119
Smith Lumber Co., Payson ... 27
Smith, Sam D. ... 32
Sondheimer Co., E. ... 30
Southern Veneer Mfg., Co. ... 86
Spencer, C. A. ... 99
Standard Dry Kiln Co. ... 19
Standard Veneer Co. ... 80
Stark & Co., Jas. E. ... 41
Steels & Hibbard Lumber Co. ... 38
Stimson & Co., J. V. ... 42
Stimson, Hardwood Co. ... 25
Stimson Veneer & Lumber Co. ... 25
St. Joseph Iron Works ... 6

Talge Mahogany Co. ...
Taylor Mfg. Co., Jas. L. ... 15
Tennessee Lumber & Coal Co. ... 33
Thomas & Proetz ... 29
Toronto Veneer Co. ... 89

Vail Cooperage Co. ... 39
Van Atta & Co., E. B. ... 105
Veneer Manufacturers Co. ... 83

Waddell Mfg. Co. ... 29
Walter & Co., B. ... 107
Walter & Sons, J. ... 18
Wayne Lumber Co. ... 42
Whiting Co., Wm. S. ... 38
Williams Machinery Co., A. R. ... 12
Williamson Veneer Co. ... 84
Wisconsin Lumber Co. ... 45
Wisconsin Veneer Co ... 79
Wood Mosaic Co. ... 87

Yates Machine Co., Ltd., P. B. ... 5
Yellow Poplar Lumber Co. ... 33
Young Lumber Co., Bedna ... 41



Universal Woodworker 323

Made in Canada

Five machines in one

Buzz Planer
Saw Table
Band Saw
Shaper
Borer

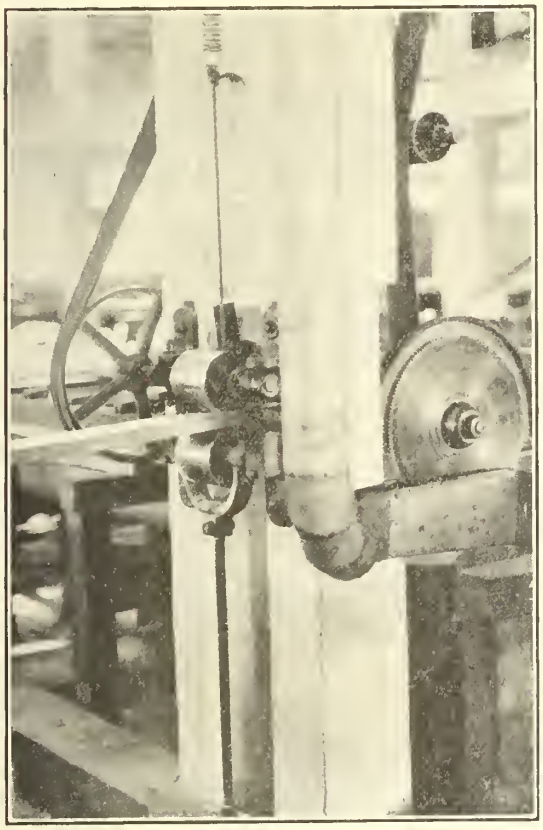
All right hand machines independently driven

Most conveniently arranged — work at one does not interfere with any other. Ample belt power — something all others are deficient in. Built on solid one-piece casting.

Cowan & Company of Galt Limited

Galt Ontario Canada

A Real Trimmer



This is a high speed machine to be used in sawmills and box factories where speed is required. Allows men to use both hands when trimming. Nothing to get out of order. This is the fastest trimmer on the market.

Arbuthnot Lumber, Sash and Door Co.

Vancouver, B.C.

He Does His Best But

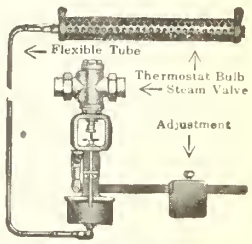
A man's eye watching the thermometer. A man's hand turning the valves. He does his absolute best, but you know that his results are not uniformly right—because at some point there was too much or too little heat.

Automatic Heat Control Stops That

At best, a man can only use his judgment of temperature, which varies from one minute to the next.

Powers Automatic Heat Regulators

Eliminate the guess work by applying the Powers Automatic Heat Regulators. They are scientifically coustructed; made to operate according to certain known physical laws. We manufacture a great variety of types suited to practically any heat regulation condition.



The Powers Regulator No. 15

Entirely self-contained, requiring no air or water pressure for operation. Prevents checking and case hardening in the kiln. Invaluable in the varnish drying room. Other types for other places.

Consult us at once. Our long experience enables us to give you definite information and intelligent advice.

The Canadian POWERS REGULATOR Co Ltd

Specialists in Automatic Heat Control

82 CHESTNUT ST., TORONTO, ONT.

(1154F)

Upholstered Furniture Manufacturers Attention!

The Construction

of our

Ball Foot

is consistent with the demands of the heaviest Chesterfield.

They will stand the roughest usage, and will add to the attractiveness of your goods. Last but not least they are reasonable in price.

J. WALTER & SONS LIMITED

KITCHENER :-: ONTARIO

For facts about successful Kiln drying ask such operators as W. B. Jones, Globe-Wernicke Company, Cincinnati, Ohio.

The Standard Dry Kiln Co.

For our new literature address:
1542 McCarty St., Indianapolis.

MILL PIPING

Shaving and Sawdust Collecting Systems Installed Complete

ALTERATIONS—REPAIRS

Neville-Cooper Co.
130 Ontario St. Toronto
Phone Main 2157

We also manufacture and erect Smoke Stacks, Boiler Breechings, Metal Cornices, Skylights, Eavetrough, etc.

"Casco" for a better product

WATERPROOF GLUE
For Jointing and Veneering

STRONG - UNIFORM
USED COLD - EASILY PREPARED
ECONOMICAL

"CASCO" Uniformity is assured because we manufacture our own Casein. : : :

The Casein Manufacturing Company
Largest and Longest Established Manufacturers of Casein Products in America : : :
15 PARK ROW, - NEW YORK CITY

Write for "CASCO" Red Book—a manual on Veneers, Panel-Making and Glue.

Samples of "CASCO" on request.

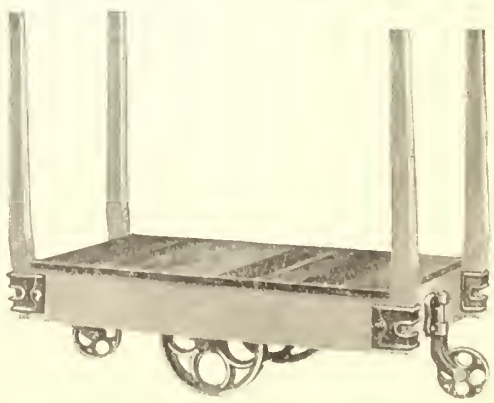
Canadian Distributors
HART & LEFEBER, LTD.
38 Grey Nun, Montreal' Que.

FACTORY TRUCKS

Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face
Weight 160 lbs.
Special sizes to order.

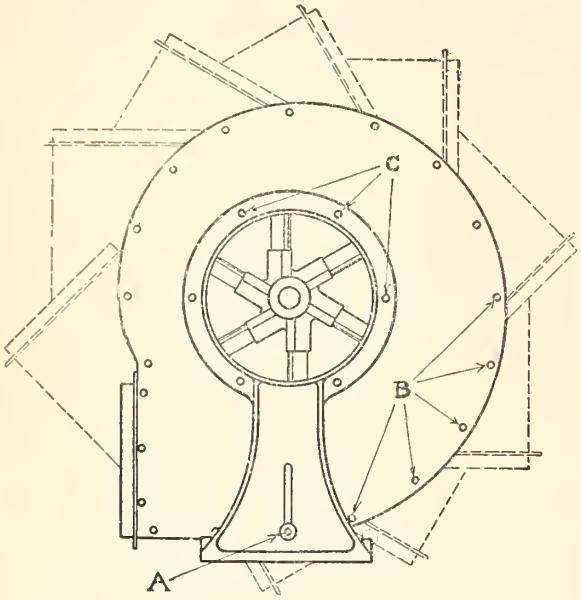
MANUFACTURED BY

P. E. SHANTZ, PRESTON, ONTARIO.



Factory Truck Style No. 26.

Canadian Mill Exhausters



One of the features of the Canadian Planing Mill Exhauster is the reversible housing. It is easily adjustable to either hand and to any discharge.

By this arrangement one fan may be used to meet all requirements, thus eliminating crossed belts and sharp angles.

Let our engineering department help you plan your refuse exhauster system.

Write for catalogue 400-13.

Canadian Blower & Forge Co.
KITCHENER, ONT.

CANADIAN·NASHUA·PAPER·CO·LTD
TRADE MARK
PETERBOROUGH ONT.

NASHUA Veneer Tapes

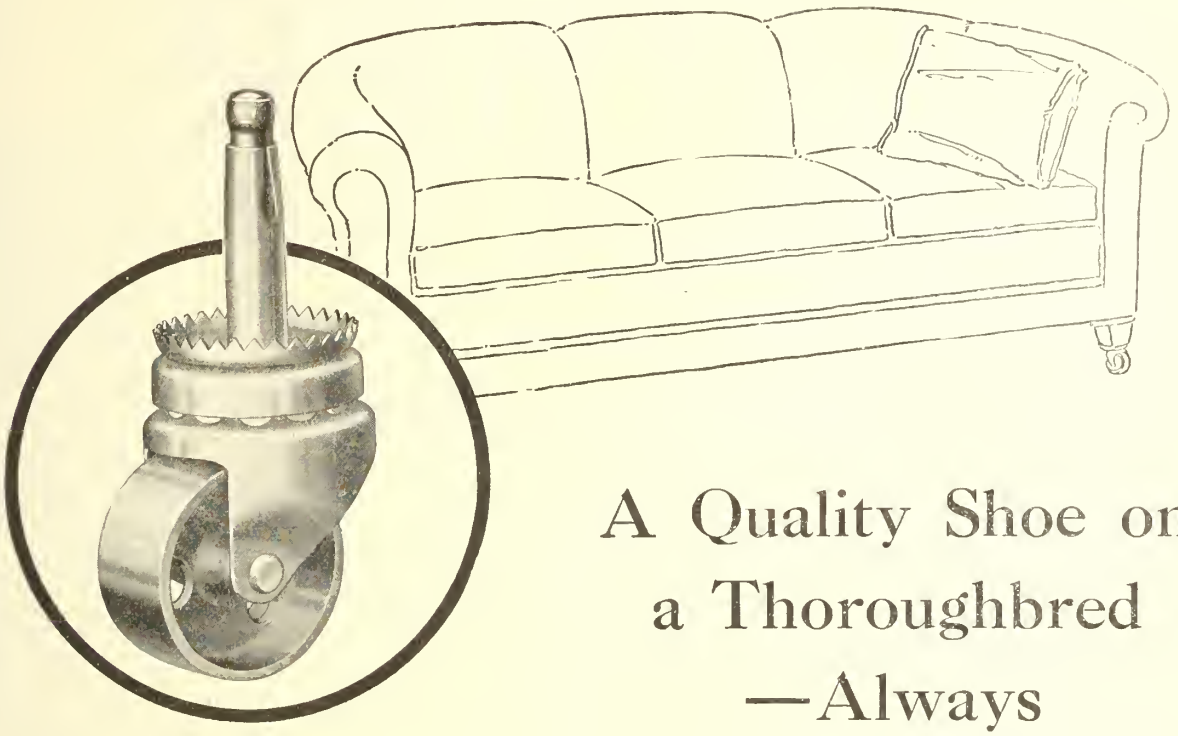
Are manufactured with a view to giving the consumer the material for his purpose, and we stand ready to develop any special requirement for you.

In purchasing our tapes you are assured of prompt **service**, guaranteed **quality** and a reasonable **price**.

Samples of our stock will be sent upon request, so that you may try them out in your plant in a practical way.

CLOTH and PAPER
Guaranteed Veneer Tapes

THE CANADIAN NASHUA PAPER CO., Ltd.
Peterborough, Ont.



A Quality Shoe on a Thoroughbred —Always

You cannot readily imagine anything but a first-rate shoe on the hoof of the pure blood Arabian steed.

Likewise high grade furniture leaving factories and retail shops daily should be equipped with nothing less than the best in casters.

Efemco Casters are thoroughly in keeping with the finest in furniture—both in appearance and in wearing qualities.

Acme Grip Neck and Plate Casters
Atlas Plate Roller Bearing Casters

Send for our latest catalog

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters

Roller Bearing Casters
Truck Casters
Automobile Accessories

Piston Rings
Grey Iron Castings

Standardized by 87 years of service.

HAFNER

MANUFACTURING COMPANY

Southern

Hardwoods

ST. LOUIS, MO., U.S.A.

ESTABLISHED 1871

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

AMERICAN WALNUT

"The Cabinet-wood Superlative."

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

The "American Walnut Period."

Are You Duly Capitalizing It?

The fact that American Walnut is so firmly established in its supremacy as "The Cabinet-wood Superlative," is of great significance to alert manufacturers. The "up-and-comers" are making preparations to cash in on the "trend of the times," in growing measure. They must do so to keep pace with the sweep of American Walnut into universal public favor.

Of course, you are among this "lucky" number?

Due to American Walnut's superior characteristics the home-loving public now thinks in terms of Walnut. The steady and healthy demand for American Walnut furniture proves the truth of this assertion.

Our Walnut Brochure, de luxe, is filled with ideas and suggestions of interest and value to the trade. A request will bring it, with our compliments.

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO, U. S. A.

Miller Lumber Company

Marianna - Arkansas

QUARTERED WHITE OAK

300,000′	4/4	No. 1 Com.
20,000′	5/4	No. 1 Com.
8,000′	8/4	No. 1 Com.
150,000′	4/4	No. 2 Com.
2,000′	5/4	No. 2 Com.

PLAIN WHITE OAK

70,000′	4/4	FAS
13,500′	5/4	FAS
300,000′	4/4	No. 1 Com.
42,000′	6/4	No. 1 Com.
35,000′	8/4	No. 1 Com.
300,000′	4/4	No. 2 Com.
11,500′	5/4	No. 2 Com.
10,500′	6/4	No. 2 Com.
20,000′	8/4	No. 2

QUARTERED RED OAK

3,200′	3/4	C & Btr.
150,000′	4/4	Nos. 1 & 2 Com.
1,000′	5/4	No. 2 C & Btr.
3,500′	8/4	No. 2 C & Btr.

PLAIN RED OAK

75,000′	4/4	FAS
13,500′	5/4	FAS
5,000′	8/4	FAS
600,000′	4/4	No. 1 Com.
33,000′	5/4	No. 1 Com.
11,000′	6/4	No. 1 Com.
48,000′	8/4	No. 1 Com.
600,000′	4/4	No. 2 Com.
9,400′	5/4	No. 2 Com.
3,000′	8/4	No. 2 Com.

MISCELLANEOUS OAK

3,700′	3/4	No. 2 C & B Qt. W. O.
5,000′	4/4	Cl. Pl. RO Stps 3-5 1/2″
8,500′	4/4	Cl. Pl. WO Stps 3-5 1/2″
7,300′	5/4	Pl. RO Step Plk. 11″ & Wdr.
5,500′	3/4	No. 2 C & B Pl. R & WO.
160,000′	4/4	S.W. R & WO.
300,000′	4/4	No. 3 Com.
20,000′	5/4	No. 3 Com.
22,000′	6/4	No. 3 Com.
12,500′	8/4	No. 3 Com.
50,000′	8/4	Bridge Plk. R & W
50,000′	10/4	" " " fwd.
200,000′	12/4	" " "

SYCAMORE

130,000′	4/4	No. 2 C & B Qtd.
1,000′	5/4	No. 2 C & B Qtd.
400,000′	4/4	No. 1 C & B

QUARTERED RED GUM

25,000′	5/4	No. 1 C & Btr.
15,000′	6/4	No. 1 C & Btr.

PLAIN RED GUM

1,100′	5/8	FAS
1,800′	3/4	No. 2 C & Btr.
40,000′	4/4	No. 2 Com.
3,300′	8/4	No. 2 C & Btr.

SAP GUM

4,200′	4/4	Pnl & No. 1 18″ & Up
50,000′	4/4	Clr strips 3-5 1/2″
20,000′	4/4	No. 1 C stps 2-5 1/2″
125,000′	4/4	Box Bds. 9-12″
150,000′	4/4	Box Bds. 13-17″
6,500′	5/4	No. 1 Com.
50,000′	6/4	No. 1 C & Btr.
6,000′	8/4	No. 1 C & Btr. Qtd.
9,500′	8/4	No. 1 C & Btr. Qtd. Stps

TUPELO

50,000′	4/4	FAS 6-12″
5,000′	4/4	FAS 13-17″
5,000′	4/4	No. 1 Com. 13-17″
12,500′	4/4	Box Bds. 9-12″
3,700′	4/4	Box Bds. 13-17″

COTTONWOOD

100,000′	4/4	FAS 6-12
30,000′	4/4	FAS 13-17″
15,000′	4/4	pnl & No. 1 18″ & Up
40,000′	4/4	Box Bds. 9-12″
30,000′	4/4	Box Bds. 13-17″
150,000′	4/4	No. 1 Com.
100,000′	4/4	No. 2 Com.

MAPLE

40,000	4/4	No. 2 C & Btr.
50,000′	5/4	No. 2 C & Btr.
75,000′	6/4	No. 2 C & Btr.
20,000′	10/4	No. 2 C & Btr

CYPRESS

20,000′	4/4	FAS
9,000′	5/4	FAS
10,700′	6/4	FAS
20,000′	8/4	FAS
250,000′	4/4	No. 1 Shop
15,000′	8/4	No. 1 Shop
30,000′	5/4	No. 1 Com.

BY MAKING TEST RUNS OF YOUR LUMBER

You will find that our stock will reduce your costs to a minimum and improve the quality of your product. Indiana hardwoods cost no more than the other kinds—then why not use them ?

We are the largest hardwood producers in Indiana and give below a partial list of stock on hand:

INDIANA QUARTERED WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
1/2″	1 car	1 car	
5/8″	2 "	4 "	
3/4″	1 "	5 "	1 car
4/4″	3 "	4 "	4 "
5/4″	1 "	3 "	1 "
6/4″	1 "	3 "	
8/4″	1 "	2 "	

Also Clear and No. 1 Common Quartered White Oak Strips.

INDIANA QUARTERED RED OAK

	1s & 2s 6″ & up	1s & 2s 9″ & up	No. 1 Com.	No. 2 Com.
1/2″—3500′				
5/8″—1 car			1 car	
4/4″—3 car		1 car	3 "	1 car
5/4″—2 "		1 "	2 "	
6/4″—2 "		2500′	1 "	
7/4″—1 "		4500′		
8/4″—2000′		3000′	1 "	

PLAIN WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	1 car	1 car	
3/4″		4000′	
4/4″	2 "	4 cars	2 cars
5/4″	1 "	3 "	1 "
6/4″	1 "	2 "	
8/4″	3 "	2 "	
2½″	½ "	1 "	

PLAIN RED OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	2 cars	2 cars	
3/4″		5000′	
4/4″	4 "	4 cars	3 cars
5/4″	1 "	3 "	
6/4″	1 "	4 "	
8/4″	2 "	3 "	
2½″	2 "	3 "	

BLACK WALNUT—Steamed Stock

	1s & 2s	No. 1 Com.	No. 2 Com.
4/4″	1 car	3 cars	12000′
5/4″	1 "	1 "	9000′
6/4″	4000′	4000′	
8/4″	1 car	1 car	

1 car 5/8″ Log Run, not steamed.

WE ARE IN POSITION TO KILN DRY THIS LUMBER. ASK FOR OUR RATES.

We also have good stocks of Poplar, Ash, Beech, Hickory, Maple, Gum, Tupelo, etc.—Write us for prices.

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

MILLS AT EVANSVILLE, IND., GRAMMER, IND., and KEIRNS, MISS.

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated

General Office, NEW ORLEANS, U.S.A

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES – that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

A few Specials :

130,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. White Oak
85,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. Red Oak
100,000 ft. 4-4 No. 1 and No. 2 Com. Plain Red Oak

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

Try a Carload-straight or mixed

Soft Oak, plain and quartered
Poplar, Walnut, Chestnut,
Ash and other Hardwoods

Get in touch with our representative

LELAND G. BANNING

Cincinnati, Ohio, Bandmill at Frankfort K Y.

Canadian Representative: A. E. Klippert, 11 Laxton Avenue, Toron'o, Ontario

FIBRO-CANE PATENTED OPEN WEBBING

If you use open cane you can use
FIBRO - KANE

Its application as panels in talking machine cabinets : : :

"Our best customers are our oldest customers"

Fibro Manufacturing Co. - Drexel Bldg., Philadelphia

British Columbia Forest Products

Technical Information

Information furnished as to the qualities, weights, strengths, and uses of all woods

INQUIRIES SOLICITED

Samples of all British Columbia woods and literature for distribution

CALL AND SEE OUR EXHIBIT

No. 1 Adelaide Street E., Toronto

(Street Floor)

Telephone Main 6872. Note: We do not quote prices.

"There Is a Reason"

(With apologies to Postum)

Why?

The R. R. May Hardwood Co., Louisville, Ky., should merit your consideration in placing orders for your 1922 Lumber requirements, if you expect to get value received in grade, manufacture, quality and texture as well as service.

(With apologies to no one)

"They Satisfy"

(With apologies to Chesterfields)

R. R. May Hardwood Co.

LOUISVILLE, - - - KY.

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

DRY STOCK

For Immediate Shipment

SOFT ELM		
6905′	1″	—No. 1 C&B
3195′	1″	—No. 2 Com.
41030′	1½″	—No. 1 C&B
2356′	1½″	—No. 2 Com.
56880′	2″	—No. 1 C&B
10046′	2″	—No. 2 Com.
110594′	2½″	—No. 1 C&B
26985′	2½″	—No. 2 Com.
11750′	3″	—No. 2 Com.
WHITE ASH		
87846′	2″	—No. 1 C&B
3072′	2″	—No. 2 Com.
139960′	2½″	—No. 1 C&B
13537′	2½″	—No. 2 Com.
18992′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.
HICKORY		
650′	1″	—No. 1 C&B
1408′	2″	—No. 1 C&B
COTTONWOOD		
1620′	1″	—No. 1 C&B
19956′	2″	—No. 1 C&B
1196′	2″	—No. 2 Com.
BLACK WALNUT		
2873′	1″	—No. 1 C&B
1151′	1″	—No. 2 Com.
WILLOW		
1446′	1″	—No. 1 C&B
CHERRY		
4747′	1″	—No. 1 C&B
2137′	1″	—No. 2 Com.
ROCK ELM		
12493′	2″	—No. 1 C&B
SOFT MAPLE		
14397′	2½″	—No. 1 C&B
BASSWOOD		
1549′	1″	—No. 1 C&B
606′	2″	—No. 1 C&B
BUTTERNUT		
2584′	1″	—No. 1 C&B
HARD MAPLE		
31788′	1″	—No. 1 C&B
243927′	1¼″	—No. 1 C&B
227707′	1½″	—No. 1 C&B
1796′	1½″	—No. 2 Com.
217401′	2″	—No. 1 C&B
11410′	2″	—No. 2 Com.
38016′	2½″	—No. 1 C&B
11091′	3″	—No. 1 C&B
2796′	4″	—No. 1 C&B
BEECH		
3000′	1½″	—No. 2 Com.
500′	2″	—Log run
250′	2½″	—Log run
350′	3″	—Log Run
100′	4″	—Log run
BIRCH		
15998′	1″	—No. 1 C&B
22311′	1¼″	—No. 1 C&B
11748′	1½″	—No. 1 C&B
50157′	2″	—No. 1 C&B
87172′	2½″	—No. 1 C&B
7866′	3″	—No. 1 C&B
PLAIN OAK		
9369′	1″	—No. 1 C&B
1107′	2″	—No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	0/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

On hand for immediate shipment

Furniture Stock

5,000	pcs. Cl. Red Gum	2½ x 2½ - 20" M
1,000	" do.	2 x 2 - 20" M
1 car	Cl. Sap Gum	2 x 2 - 30" M
		2½ x 2½ - 30" M
1 "	Clear W. & R. Oak	2 x 2 - 19" M
1 "	do.	1¾ x 1¾ - 19" D
1 "	do.	1½ x 1½ - 19" D
1 "	do.	1¼ x 2 - 40" D
1 "	do.	1 x 1 - 48" D
2 "	do.	2 x 2 - 30" D
50,000	pcs. Qtd. W. Oak ¾ x 3" & wider	- 22" D
150,000	" Qtd. R. Oak do.	D
40,000	" Qtd. R. Oak 1 x 2½" & wider.	- 18" D
1 car	Clear Ash 1¾ x 1¾ & 2 x 2 - 38, 44 & 50"	D

Miscellaneous:

2 cars	Clear Oak Auto Bow Strips	1-⅛ x 1⅝ - 7' 6" & 7' G
1 car	Hickory	2 x 2 - 40" D
1 car	Hickory Pitmans	1-⅝ x 1-⅞ - 38" D
1 "	Clear Ash	2 x2½ - 48" D
1 "	Clear Soft Elm	do. D

D - Dry; M - Partly dry; G * Green.

We can furnish your requirements in square or flat dimension. Let us have your specifications.

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office, Dimension Mill & Yard
Belt Line at McLean.

MEMPHIS - TENN.

H. J. RICHARDS J. T. KENDALL

Richards Hardwood Company

746-7 BANK OF COMMERCE BUILDING

Memphis, Tennessee, U. S. A.

Successors to Dacus-Richards Hardwood Co.

We make a specialty of catering to the Canadian trade and are in position to make reasonably prompt shipment of practically any Southern Hardwoods which you are needing. Your orders and inquiries will be highly appreciated and will receive our prompt and personal attention.

Specializing in Delta Red and Sapgum, Oak, Elm and Poplar.

Thomas & Proetz Lumber Co.

3406 N. Hall St.

ST. LOUIS, MO.

BELZONI, MISS. —— MILLS —— CALION, ARK.

Com. & Btr. Quartered White Oak
1″ —925,000 ft.
1¼″—335,000 “
1½″—115,000 “

Com & Btr. Quartered Red Oak
1″ —380,000 ft.
1¼″—150,000 “
1½″—275,000 “

Com. & Btr. Plain Red Oak
1″ —150,000 ft.

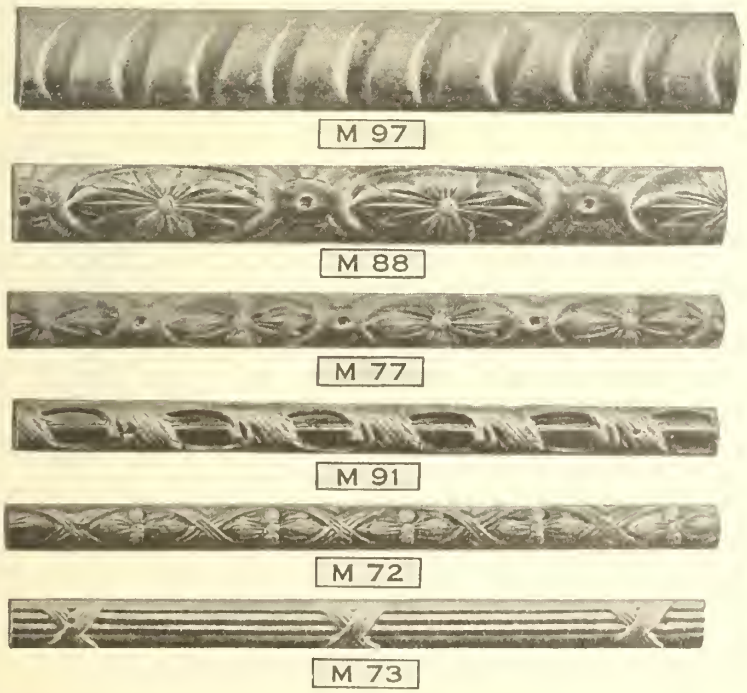
Com. & Btr. Plain White Oak
1″ —150,000 ft.
1½″—250,000 “

Com & Btr. Red Gum Plain & Quartered
1¼″—300,000 ft.
2″ —500,000 “
2½″—235,000 “
3″ —180,000 “

Com. & Btr. Sap Gum
1″ —350,000 ft.
1¼″—433,000 “
1½″—750,000 “
2″ —980,000 “
2½″—170,000 “
3″ —350,000 “

Com. & Btr. Quartered Black Gum
1″ —290,000 ft.

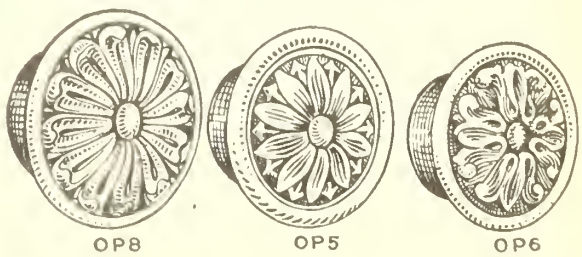
Com. & Btr. Tupelo
1″ —235,000 “



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.



Waddell Manufacturing Company

Coldbrook and Taylor, N. W. Grand Rapids, Mich.

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft.....8/4 No. 1 Com.

Band-mills at Baton Rouge, La., Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

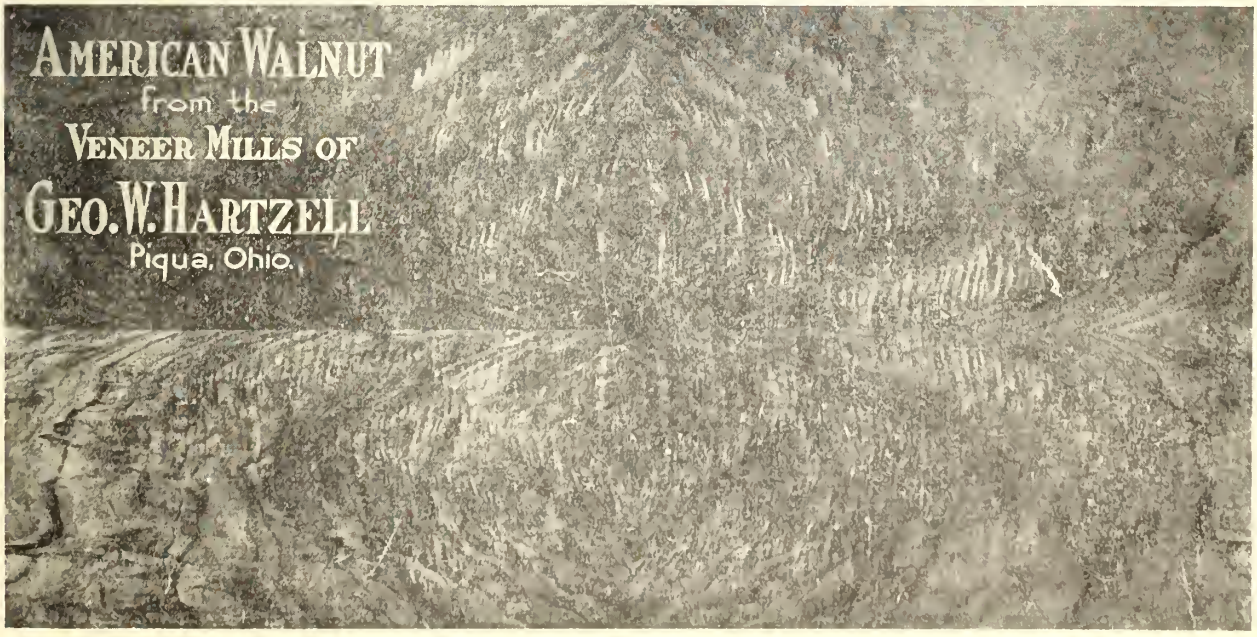
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

SAM D. SMITH

Wholesale Dealer and Manufacturer in

NORTHERN and SOUTHERN HARDWOODS

305 Kent Building, Toronto

Specialty—Sawing Dimenison Stock to Order

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE LA.
Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.
Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

CHARLES O. MAUS
Canadian Representative

J. H. Bonner & Sons

Memphis, Tenn.
Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn
Hardwood Lumber

Write or wire for prices on
Gum, Oak, Elm, Etc.

Can You Use the following bone dry stock, which we offer for direct mill shipment, ready for immediate loading. Please wire us at our expense for delivery prices.

2 cars 4/4 Fas Plain White Oak
3 " 4/4 No. 1 Com. & Sel. Pl. White Oak
1 car 4/4 " " " " Red Oak
1 car 5/4 No.1 Com. & Sel. Plain Sap Gum
3 cars 4/4 " " " " " "
2 " 4/4 Fas Plain Sap Gum

Your Enquiries will be appreciated.

GENERAL HARDWOOD LUMBER COMPANY
118 North La Salle Street - - - - - CHICAGO, ILL.

"Quality Lumber Guarantees Value Received"

ELM MAPLE

FOR SALE **RUSH LUMBER COMPANY** *FOR SALE*

GUM OAK

ASH POPLAR

QTD. WHITE OAK					
4-4	F. A. S.	2,000′	4-4	Sound Wormy	25,000′
4-4	F. A. S. 10″ & up	1,000′	5-4	F. A. S.	2,000′
4-4	No. 1 Com.	15,000′	5-4	No. 2 Com.	13,000′
4-4	No. 2 Com.	15,000′	6-4	No. 1 Com.	2,000′
5-4	F. A. S.	14,000′	PLAIN RED OAK		
5-4	No. 1 Com.	8,000′	3-4	No. 1 & 2 Com.	70,000′
5-4	No. 2 Com.	4,000′	4-4	F. A. S.	2,000′
6-4	No. 1 Com.	30,000′	4-4	No. 1 Com.	10,000′
6-4	No. 2 Com.	20,000′	4-4	No. 2 Com.	20,000′
8-4	F. A. S.	5,000′	5-4	F. A. S.	7,000′
8-4	No. 1 Com.	3,000′	5-4	No. 1 Com.	15,000′
PLAIN WHITE OAK			5-4	No. 2 Com.	3,000′
4-4	No. 1 Com.	5,000′	QTD. RED GUM		
4-4	No. 2 Com	8,000′	4-4	F. A. S.	7,000′

4-4	No. 1 Com.	13,000′	POPLAR		
5-4	F. A. S.	2,000′	4-4	No. 2 A Com.	25,000′
6-4	F. A. S.	3,000′	4-4	No. 2 B Com.	35,000′
6-4	No. 1 Com.	14,000′	5-4	Sel. & Bet.	9,000′
RED GUM S. N. D.			5-4	Saps	3,000′
8-4	No. 1 C&B.	70,000′	5-4	No. 1 Com.	12,000′
10-4	No. 1 C&B.	40,000′	5-4	No. 2 A Com.	8,000′
SAP GUM			6-4	Sel. & Bet.	7,000′
5-8	No. 2 Com.	7,000′	6-4	No. 2 Com.	12,000′
5-4	F. A. S.	1,000′	8-4	Sel.	3,500′
5-4	F.A.S. 13″ & Up	4,000′	8-4	Sap	8,000′
5-4	No. 1 Com.	9,000′	8-4	No. 1 Com.	3,000′
6-4	F. A. S.	11,000′	MISCELLANEOUS		
6-4	No. 1 Com.	6,000′	4-4	L. R. Qtd. B. Gum	25,000′
6-4	No. 2 Com.	4,000′	4-4	L. R. Pln. B. Gum	25,000′

MEMPHIS, TENN.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. Submit your enquiries to our Sales office, Cincinnati, Ohio

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVE. — TORONTO

Full or mixed cars for immediate delivery.

Hard and Soft Maple
Beech, Birch

Rock and Soft Elm
and Basswood

Hardwoods in 4x4, 4x6, 1″ and 2″. No. 3 Common

Why not get in touch with us.

Lumber

Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers

Walnut and Mahogany

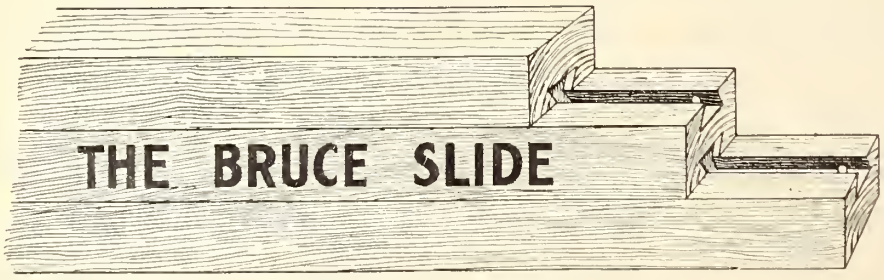
WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 38 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

TABLE SLIDES TABLE RIMS TABLE PINS



Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

Anderson, Shreiner & Mawson

Phone Main 1604

43 Victoria St., TORONTO

Lumber Manufacturers and Wholesalers

Birch, Maple, Elm, Ash and Basswood

Write o "Phone" for Prices.

Mills at South River, Ont.

McDonagh Lumber Co.

203-204 Confederation Life Bldg. TORONTO,

Wholesa e Hardwoods

Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

The London Lumber Co. Ltd.

WHOLESALE LUMBER

Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses, Soft & Hard Maple, Ash, and Basswood. Write us for quotations.

487½ Richmond St. London, Ont.

Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

PERCY E. HEENEY

Office: 298 Breithaupt St., KITCHENER, ONT.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

Buffalo for Hardwoods

"LET BUFFALO DO IT"

Buy and Sell Your Hardwoods in Buffalo

Do you want prompt shipment? We can give you service.
Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.
Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

Frank T. Sullivan
Specialities:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
Northern Grey Elm
and
Brown Ash
Niagara Street Cornor Arthur

ATLANTIC LUMBER COMPANY
HARDWOODS
West Virginia Soft Red and White Oak
Our Speciality: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller, Sturm & Miller
1142 Seneca Street
Hardwoods of All Kinds

YEAGER LUMBER CO., Inc.
SPECIALITIES
Oak, Poplar, Ash, Maple
932 Elk Street.

STANDARD HARDWOOD LUMBER COMPANY
HARDWOODS
Prompt Shipment { From Buffalo Yards or from mill direct to you
8 Million Feet Dry Stock on hand
1333 Clinton St.

G. Elias & BRO., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and fir timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders

Buffalo Hardwood Lumber Co.
J. B WALL Pres. T. H. WALL Vice-Pr.
M. M. WALL, Treasurer
940 SENECA ST.
We Specialize in White Ash, Oak, Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

HUGH McLEAN LUMBER CO.
Hardwoods of all Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

TAYLOR & CRATE
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill — *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White Oak Veneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

Arkla Lumber & Mfg. Company

Main Office: - St. Louis, Mo

Manufacturers and Wholesalers

Ash—Plain and Qtd.
White and Red Oak
Poplar, Cypress, Gum

In addition to stocks at Mill, we carry a well assorted dry stock of all items on our St. Louis yard available for immediate shipment. Write or wire us (our expense) for quotations.

F. HUNTINGTON SMITH
Canadian Representative

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

ASH
OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

OUR EXPORT BRAND

Service **LHC** *Quality*

Prompt **Shipment**

SPECIAL
Plain White Oak
50 M' 1" FAS
30 M' 1¼" FAS
12 M' 1½" FAS
15 M' 2" FAS

SPECIAL
Plain White Oak
70 M' 1" No.1 C&S
20 M' 1¼" No.1 C&S
20 M' 1½" No.1 C&S
15 M' 2" No.1 C&S

GUM
ASH
OAK
POPLAR
CHESTNUT

LIVERPOOL HARDWOOD COMPANY Inc.

50 Church St. NEW YORK CITY
Bank of Commerce Bldg. MEMPHIS, TENN.

Sell West

Canada's great Inland Empire extending from the Great Lakes to the Pacific is an expansive market for Furniture

The "Commercial and Retail Merchants' Review" offers advertising space that reaches 75 per cent. of the buying power of the four Western Provinces. We will gladly furnish sample copies on request.

The great distances between buyers make trade papers the most profitable sales force

Commercial
and Retail Merchants' Review

212 Winch Building
VANCOUVER

302 Travellers Building
WINNIPEG

Branches in Montreal, Toronto, Chicago and New York

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut
Mahogany, Teak, Oak
Ash, Cypress

ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

The McLennan Lumber Co.
Limited

MONTREAL

Hardwood Dowels

Plain, Straight and Spiral Grooved

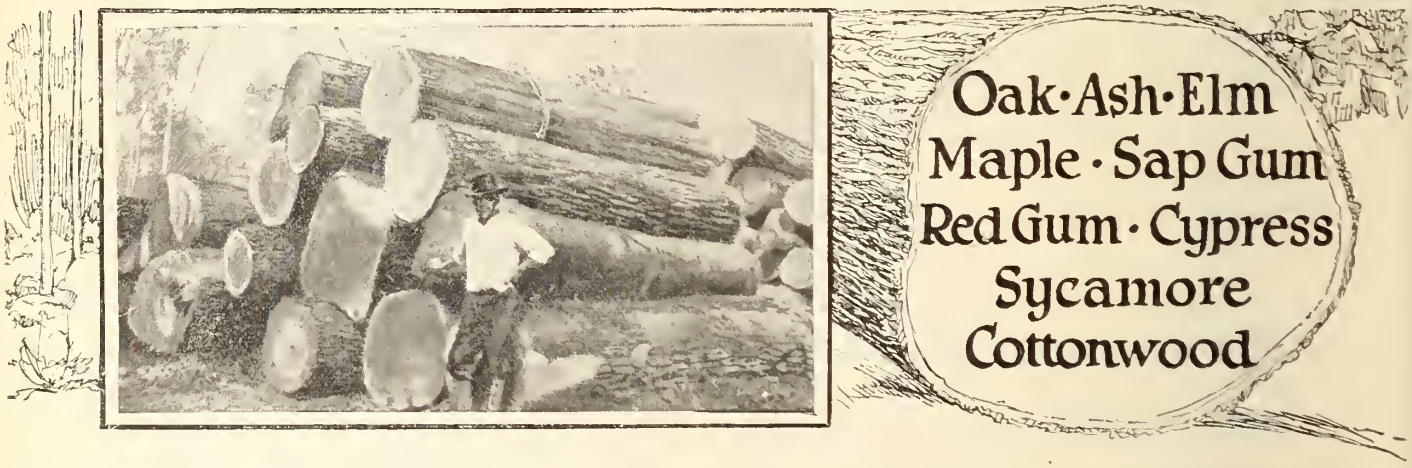
"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co. Limited

ORILLIA ONTARIO

Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.



THE buyer of hardwoods has a right to insist that he receive his shipment when promised, that he get the grades specified and the full amount called for in his order. The assurance that this will always be true depends upon the reliability of the concern he patronizes.

The reputation of our company for 35 years, and the assurance that we will be in business for many years to come, is a guarantee to our customers that their orders will be faithfully executed to the full quantity and on the exact terms specified.

In a rising market it is doubly important to consider reliability when placing orders

CHAPMAN & DEWEY LUMBER COMPANY

940-950 Bank of Commerce & Trust Building, Memphis, Tennessee.
Branch Office: Rialto Building, Kansas City.

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

BEDNA YOUNG Lumber Company

Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for

High Grade Lumber

please let us have your enquiries.

Sales Office: 610 Lombard Bldg.
Indianapolis, Indiana

Southern Hardwoods

of standard excellence, including band-sawn white and red oak, gum and ash; Oak Flooring, too! In the same car, as well as square-edge parquetry strips, there are oak trim and mouldings.

Immediate Service
for Exacting Buyers

E. L. BRUCE COMPANY
MANUFACTURERS
MEMPHIS, TENN.

Band Mill: Little Rock
Oak Flooring Plants: Memphis; Little Rock

WAYNE LUMBER CO.

Manufacturers and Wholesalers

Canadian Hardwoods

- - BIRCH AND MAPLE

OUR SPECIALTY

Elm, Ash, Basswood, Beech, Chestnut, Oak, and Poplar

110 West 40th St. New York

Canadinn Representntive,
D. Cote, 730A Champagneur, Outremont, Montreal

Band Sawn West Virginia Hardwoods

Our timber, of virgin growth in Greenbrier and Pocahontas Counties, limestone soil, gives a combination of Texture, Quality and Character that is most desirable to the Woodworking trade.

The most critical Hardwood users are among our best accounts. Why?

The W. C. Barlett Lumber Co.
Charleston, W. Va.

HARDWOOD LUMBER

"A Quality you will admire"

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Kiln Dried Products

Our kiln at Owensboro is a thoroughly modern equipment for handling green or dry lumber with efficiency and entire satisfaction.

Our facilities enable us to give real service—straight or mixed carloads.

Try our soft textured and finely figured quartered-sawn red and white oak. It will please you.

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills Owensboro; Campbellsville, Kentucky

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Reputation - Making Lumber

The person buying a piece of furniture is often attracted by the beauty of the wood even before looking for signs of good workmanship and other essentials.

That is the kind of lumber you want.

And we do not hesitate in saying we can supply you with it.

Just let us have a trial order.

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY Memphis - Tennessee SERVICE

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

OAK

Plain and Quartered

Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manufacture.

Oak Timbers and Planking

The Mowbray & Robinson Co.
(INCORPORATED)

Manufacturers

Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative:
A. K. Johnson, Traders Bank Building, Toronto, Ont

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment

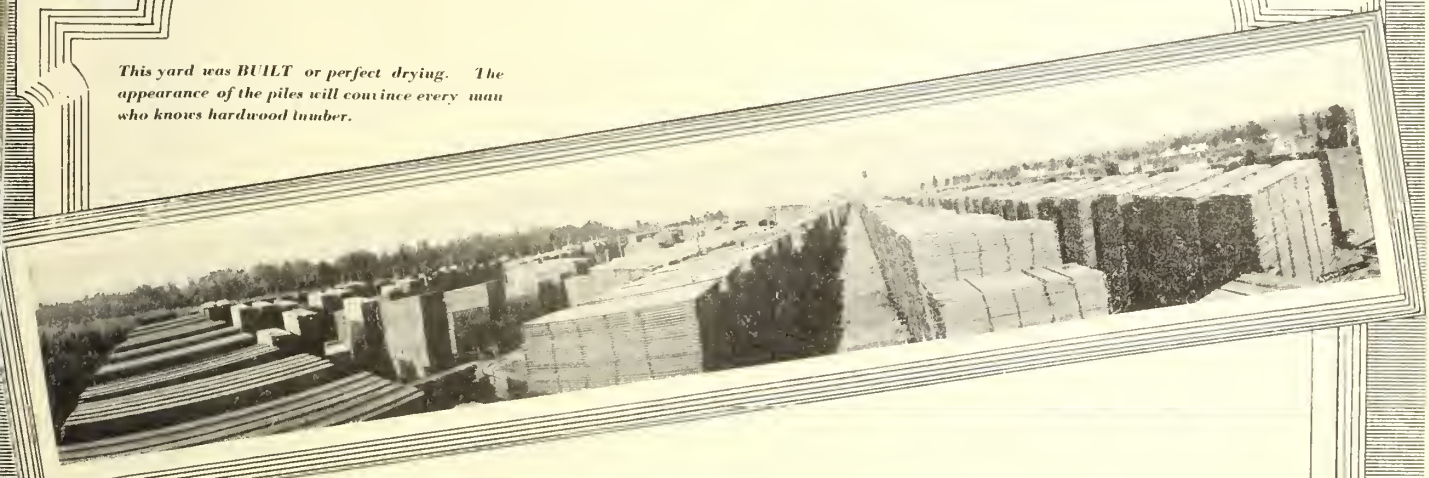
All grades and thicknesses

Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

WIS



This yard was BUILT or perfect drying. The appearance of the piles will convince every man who knows hardwood lumber.

Lumber Can't Be ALWAYS Good Without Perfect Piling

The *correct* drying of hardwood lumber is a science based on definite formulae. Recognizing this, our yard was *built* to insure the most perfect possible drying.

Everyone familiar with lumber will recognize what the appearance of the piles in the accompanying photograph means. They are your guarantee of flat, straight, clean lumber.

Our list includes the standard species and grades of southern hardwoods with NOTHING PICKED OUT, and has behind it a comprehensive and conscientious desire to give the customer his full measure of value and service,

Wisconsin Lumber Company

Chicago, Illinois

BAND MILLS, DEERING, MO.

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.—58,000
1¼ in.— 3,500
1½ in.—

CHERRY

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
1 in.	44,500	.....	203,900	18,500
1¼ in	4,900	.....	37,600	7,500
1½ in.	2,000	.....	34,700	36,300
2 in.	6,000	.....	22,200	61,900
2½ in.	5,500	.....	4,300	2,200
3 in.	25,700	.....	6,500	3,300
4 in.	4,000	.....	900	400

CHESTNUT

	1 & 2	Clear Strips.	No. 1 Com.	S.W. & No. 2 Com.
¾ in.	500	.....	56,000	91,000
1 in.	11,000	500	45,000	1,000
1¼ in.	66,800	300	100,200	159,200
1½ in.	34,500	.....	40,000	.....
2 in.	2,200	.....	15,300	89,200
2½ in.	4,000	.....	1,500	.....
3 in.	1,100	.....	1,000	500
4 in.	1,500	.....	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
½ in.	6,500	.....	.....	.....
¾ in.	900	300	23,600	9,000
⅝ in.	2,800	.....	5,500	800
1 in.	17,300	10,000	52,400	27,000
1¼ in.	5,000	.....	6,000	.....
1½ in.	600	.....	2,400	.....
2 in.	.....	.....	25,100	5,700
2½ in.	2,000	.....	400	.....
3 in.	2,000	.....	1,300	.....
4 in.	2,500	.....	1,700	.....

PLAIN WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	1,000	.....	.....	.....
½ in.	100	.....	.....	.....
⅝ in.	2,150	.....	8,000	16,900
¾ in.	274,800	.....	453,800	122,000
1 in.	42,300	1,700	78,000	85,200
1¼ in.	6,300	.....	15,100	.....
1½ in.	51,300	.....	84,000	12,000
2 in.	29,000	.....	125,000	54,000
2½ in.	152,800	.....	69,500	3,000
3 in.	55,800	.....	75,800	14,400
3½ in.	4,500	.....	4,000	1,500
4 in.	65,000	.....	38,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	24,200	.....	.....	.....
¾ in.	170,000	.....	327,000	65,800
⅝ in.	2,400	.....	77,000	42,600
1 in.	30,200	3,150	56,000	125,400
1¼ in.	11,700	2,400	16,600	.....
1½ in.	138,900	4,300	46,200	32,000
2 in.	91,500	.....	162,000	71,000
2½ in.	70,100	.....	26,000	3,700
3 in.	23,800	.....	20,500	7,000
4 in.	16,600	.....	10,900	.....

QUARTERED RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
¾ in.	1,700	.....	9,700	500
1 in.	10,200	5,400	7,500	1,400
1¼ in.	2,000	.....	.....	.....
1½ in.	.....	.....	.....	.....
2 in.	.....	.....	7,400	.....

SAP GUM

	1 & 2	Strips.	No. 1 Com.	No. 2 Com.
1 in.	.....	16,000	21,000	.....
1¼ in.	.....	.....	.....	.....
1½ in.	.....	2,400	6,000	13,500
2 in.	.....	.....	5,700	10,400
2½ in.	.....	.....	.....	.....

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	20,000	9,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

	No. 1	No. 2
1 in.	16,300	10,900	9,500
1¼ in.	6'000	8,325	.....
1½ in.	12,000	13,300	9,500
2 in.	9,000	3,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	2,000	6,000	7,000
5/4	9,400	10,800	.....
6/4	8,900	5,500	4,600
8/4	1,300	19,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No.2 Com.
⅝ in.	18,000	15,800	31,300	800
1 in.	27,000	5,200	91,900	.....
1¼ in.	22,300	360	5,700	6,000
1½ in.	19,100	13,000	29,000	7,500
2 in.	15,000	.....	10,500	24,500
2½ in.	10,800	6,000	.....	.....
3 in.	17,900	.....	11,400	47,000
4 in.	6,500	.....	300	450

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars.

All Canadian and American Hardwoods

Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

EASTERN BRANCH—38 GREY NUN STREET, MONTREAL

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO
Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.
Subscription, $2.00 a year; foreign, $2.50.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 Toronto, January, 1922 No. 1

Good Market for Wood Products

Whether or not activity in the construction industry is the key to prosperity in the woodworking field, it is a fact that when builders and contractors are busy, the woodworking industry prospers in proportion. That being the case, sash and door men, furniture manufacturers and others interested in the wood-using trade, have every reason to view 1922 with no small degree of optimism. An analysis of a report recently issued by MacLean Building Reports, Limited, Toronto, would seem to indicate that the year upon which we have just entered, gives promise of being a good one for the woodworking industry.

According to the figures contained in this report, the value of construction awarded during 1921 was $240,133,300 as compared with $255,605,500 for 1920, and $190,028,300 in 1919. Judging from these totals, it would appear as if the building industry had suffered a slight set-back during the past year. However, when one considers that construction costs have eased off nearly 20% and also that the purchasing power of the dollar has increased, the conclusion reached is that the volume of work undertaken during 1921 was considerably in excess of that entered upon during 1920, in spite of the fact that the value of the contracts awarded was not so great.

A closer study of this report reveals some interesting facts. The value of residential contracts awarded was $76,655,400 in 1921, as against $54,891,100 in 1920, a gain of nearly $22,000,000. Business building is given as $84,721,700 for 1921, in comparison with $86,073,200 for 1920. In the industrial field there has been a marked falling off, the figures being $16,503,700 for 1921, as against $64,625,900 for 1920. What consolation do we find here? Simply this, that while industrial work, which is largely concrete, brick and steel, has fallen off, business buildings, which include stores and office structures, together with residential work, particularly the latter, show a marked increase. Woodwork of all kinds enters largely into the construction and finishing of these two classes of buildings. As long as these special fields show marked activity, the woodworking industry will experience a good demand for its products. The increase in the construction of houses means an enlarged market for furniture, pianos, phonographs and many other articles of wood.

The year 1921 might well be called a "house-building year." More houses were erected in that period than in any other year on record, 16,000 having been constructed. One wonders how near this comes to filling the demand. In Canada, 110,000 couples were married last year and 117,000 immigrants landed on our shores, yet only 16,000 new homes were put up. Not enough to take care of those who were married without considering the 117,000 immigrants. It is estimated that we are still short somewhere in the neighborhood of 165,000 residences.

These figures indicate the trend of development in the building field, a development which augurs well for woodworkers. There does not seem to be any reason why 1922 should not show even greater activity in the residential and business construction branches of the building industry. A demand for these classes undoubtedly exists. The year 1921 ended strong and the momentum gained in the closing months cannot help but mean renewed building activity as soon as weather conditions permit. In November the total value of contracts let was $16,639,000, while during December the figures jumped to $19,118,500, a gain of practically $2,500,000. It might be said in passing that this is the second largest December total on record, being exceeded only by December1912. Construction costs are well down from the high peak of 1920, money is easier, conditions in the bond and investment fields warrant the assumption that more money will be available for mortgages and construction work. Sizing up the whole situation, there does not appear to be any reason why building should not be conducted on an increasing scale during 1922 with a corresponding degree of prosperity for the woodworking industry.

$10,000,000 Worth of Hardwoods

The woodworking industry of Canada is practically entirely dependent upon American manufacturers of hardwood lumber for such as oak, walnut, gum, mahogany, chestnut, etc. According to the figures issued by the Dominion Bureau of Statistics at Ottawa, covering the fiscal year ending March 31st 1921, the value of such hardwood lumber imported during that year was in excess of $10,000,000. For the greater part of this period the woodworking industry was faced with a greatly curtailed demand for its products with the result that the quantity of lumber purchased was well below what it would have been under ordinary conditions. During a normal year when furniture and other articles of wood are moving freely, the purchase of hardwoods would be far greater than shown in this report.

Some of the items were tabulated and classified and are as follows:-

Red Cedar, satinwood and Ebony	$ 44,420
Cherry Chestnut, Hickory and Whitewood	1,136,901
Gum	1,007,697
Mahogany	518,325
Oak	1,506,207
Redwood	18,750
Walnut	287,060
White Ash	118,718
Whitewood and Yellow Poplar	558,562
Veneers of Oak, Rosewood, not over 3/32	649,845
" in other woods, not over 3/32	261,837

A. R. WHITTEMORE
Manager MacLean Building Reports, Limited, Toronto.

Prosperity is Coming

Let's Go Out and Meet It

Review of building industry for 1921, Giving trend of development and probable activit for 1922

By A. R. Whittemore*

The construction industry in the principal countries of the world is, with the exception of agriculture, greater than any other industry, when the yearly volume, expressed in money, is taken into consideration, and it is the greatest of all when expressed in terms of labor employment. It is computed that for the successful operation and carrying on of structural activities there are required the products of over 3,000 industries. It is estimated that this industry in Canada represents a value of $7,700,000,000 or 27 per cent of the national wealth. Fully 1,100,000 persons, either as workers or as members of workers' families, are estimated as deriving their living from this field, either directly or through manufacturing and mining products used in the construction industry.

This is a growing country; it requires in connection with that normal growth a correspondingly normal growth of building. If we go back to the year 1910 and trace the increase up to 1914, this normal increase is quite clearly defined. The line marked XY on the chart, graphically illustrates this point. This chart is developed by using the monthly averages and their increases up to the war, and theoretically continuing the increae up to the present. Since the growth of the country has continued fairly consistently year by year, such a chart cannot be said to be unreasonable or to distort the situation to any extent.

Volume Based on 1913 Costs

This chart shows a very great falling off in building of all kinds during the war—a greater falling off in actual volume of work than is indicated by the money totals of work let—because, as we know, the costs of building increased over that period quite substantially. The black line on the chart shows the value of construction contracts awarded, based on 1913 construction costs, with subsequent price inflation eliminated. These figures cover the small and rural districts as well as the large cities. In order to arrive at this curve, 1913 was taken as a normal base. In 1914 and 1915 costs dropped, and then in 1916 and 1917 the cost began to rise, as compared with the volume, until 1920, when the actual cost of construction work was 165 per cent more than what it would have cost at 1913 prices.

The dotted line on the chart shows the total value of construction contracts awarded in Canada during the past eleven years with their values placed at the current costs of the respective years.

Volume of Depressed Building in Canada

The shaded area on the chart between the estimated normal increase straight line and the black line indicating volume of quantity, gives a fair idea of the shortage of construction work in Canada and is the strongest possible way of indicating the real situation. The difference between the normal requirements of the country up to date and the buildings of all kinds provided shows a great cumulative volume of work unquestionably held back and actually required to bring the situation to normal. What we beleive to be a fair estimate of what this means to the industry (and we think that, while it may be based on more or less theoretical conditions, it is nevertheless reasonable) is that this country is short of buildings and public works at the present day, including dwellings and works of all kinds, amounting to the staggering total of one and one quarter billion dollars. If this represents the demand for building in Canada, it promises great activity in this industry, with resulting advantages to the whole country. No industry that we know of is as well fortified by a large reserve of deferred

* Address delivered at luncheon tendered the Canadian Lumbermen's Association in Toronto.

work that must be taken in hand sooner or later.

At the meeting of the Associated General Contractors of America, held in Washington last September, the statement was made that building is the key to employment. It was shown that for every 200 people employed in construction 500 to 700 are set to work in basic industries, such as lumber, cement, manufacturing, mining, transportation, etc.

Review of Building in 1921

Contracts awarded for construction in Canada in 1921 fell but little short of the previous year in value. The total amount for the year was $240,133,300 against $255,605,500 in 1920, $190,028,300 in 1919 and $99,842,100 in 1918. The most sweeping changes for the year took place in the increase in residential building and public works construction, and the decrease in the industrial as compared with the previous year. Residential building amounted to $76,655,400 against $54,891,100 in 1920. Business building was practically unchanged and constituted the largest group at $84,721,700 against $86,073,200. Industrial was $16,503,700 compared with $64,625,900. Public works construction was $62,252,500 against $50,015,300. During 1921 contracts were awarded for 16,283 residences, 3,224 business buildings, 241 industrial buildings and 1,136 public works.

Returns for December were $19,118,500, being the second largest December total on record, being exceeded only once and that in the boom time of December 1912 with a total of $31,125,528.

Largest Housebuilding Year on Record

1921 was the largest housebuilding year on record in Canada. However, despite this, a very real shortage still exists. Last year, for instance, 16,000 houses were built, but 110,000 couples were married. There were 117,000 immigrants who would require at least 20,000 homes. Add to this the additional thousands who are doubled up with friends or relatives, and it is easy to see why Canada requires at least 165,000 more homes.

The significance of these facts is comprehended when we realize that as soon as the wheels of industry are turning again, and the factories already built are working at normal capacity, there will be a shortage of homes far greater than Canada has ever known before. The small moderate-price dwelling is decidedly in the ascendancy.

Will Not Return to 1913 Levels

We hear a great deal of loose talk about lumber costs. Some people imagine that prices will return to the levels of a decade ago. It is our opinion that this can never come to pass. On what grounds do we base this statement? Simply by taking cognizance of what has happened in the United States and what is happening in Canada.

The index number of 14 lines of lumber compiled by the Department of Labor indicate that present prices are 80.3 per cent more than in 1913. The peak was reached in May 1920, when prices were 195.8 per cent over 1913 levels. Present costs are 38.9 per cent less than peak prices.

Comparative wholesale prices obtained last week show some remarkable reductions as compared with the high prices of 1920. On 7 lines of hemlock the peak price was 122 per cent over 1914, but is now only 45 per cent. 14 lines of pine showed a high price 171 per cent over 1914 but are now 119 per cent. 4 lines of spruce were 135 per cent over 1913 but have now declined to 13 per cent over 1913.

Current prices of certain lumber commodities bring forward the fact that to-day's producing cost and selling prices are so close together as to retard production. The present situation is such that the small margin of profit in production of some of these articles has so reduced output that should purchasing be increased to any extent, the shortages developing would be apt to produce again the dangerous runaway market. Such a condition would be most undesirable.

(Continued on page 98)

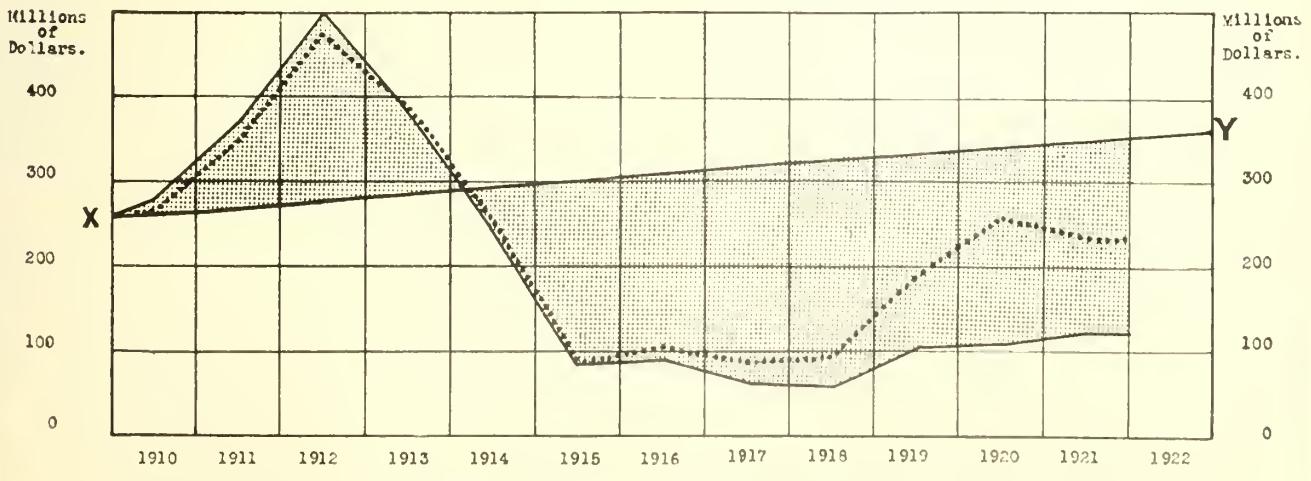


Chart Showing How Actual Construction Dropped Below Normal Requirements

Sidelights on Furniture Exhibitions

Attendance at Stratford, Kitchener and Toronto up to Expectations—Satisfactory Volume of Business Placed—Trend of Design and Finish

The eyes of the furniture industry are focused, at the present moment, on exhibitions which are being held at Toronto, Kitchener and Stratford. To many, these displays are a barometer by which the prospects for the next six months or year may be judged. What satisfaction or cause for hope is to be found in the results attending the first ten days of these exhibitions?

The writer has just returned from a visit to the different markets. Sizing up the shows in the light of information received and opinions expressed, it would appear as if on the whole they are very satisfactory. A gratifying number of buyers have made the rounds, and while the orders placed may not have been as large or as numerous as many manufacturers were expecting, yet there has been a very satisfactory turnover. Better still, the visiting dealers were, on the whole, very optimistic. This probably is the most hopeful feature.

Do Dealers Come to Buy?

The furniture dealers of Canada do not seem to have accepted the idea, as have many American retailers, of attending the markets with the attention of restocking their floors and placing orders for future delivery. Their attitude is rather that they want to see the new designs and finishes, gain an idea of prices, perhaps buy a few sample pieces and then when the travellers call, they are in a position to talk business. For this reason and because many retailers promised orders when the travellers called, it was felt in some quarters that the real results of these shows will be forthcoming when the various representatives make their rounds of the trade.

It was rather difficult to gain a clear conception of the extent to which the dealers were buying. Some manufacturers were enthusiastic over the volume of business they had secured, while others were decidedly disappointed. In one way it it difficult to account for this uneven distribution of orders. Practically all furniture makers were out with new designs, new finishes and had figured cost as low as was consistent with present replacement values, yet some seem to have brought out designs which took the eye of the buyer, while others were not so fortunate. The law of compensation or the law of averages seemed to hold good, for while certain manufacturers claimed that the volume of orders placed with them was greatly in excess of those received in January 1921, more than double in some cases. Others, who enjoyed a good business at 1921 market, were hardly doing anything.

Medium Grade Lines in Demand

The demand tended toward the medium grade lines. Not that the higher class furniture was a drug on the market for many nice orders were placed for quality stock, but there was a feeling on the part of the retailers that it was going to be easier to sell medium-grade lines than high-grade furniture. Another feature was that freak designs and freak finishes were not bought up like hot cakes. In this respect, at least, our Canadian retailers are inclined to be conservative.

As estimated previously, all the furniture makers were showing new designs. Many outdid themselves in an effort to produce the best possible, and in this their efforts were successful. There was a lot of extremely attractive furniture to be found, furniture that for design, quality and workmanship compares favorably with anything produced on this continent. The trend of these new designs is not very clear. Each manufacturer seemed to follow his own ideas, though there was a tendency to get away from what might be termed true period designs, if any of the furniture placed on the market in recent years could be termed true period.

Walnut seemed to be the most popular wood, though oak in the quieter, more attractive finishes, is coming back strong. Mahogany and gum were not so much in evidence. If some of the newer finishes could be applied to figured red gum without losing the variety and beauty of its grain, furniture made of this wood should find a ready demand.

All the newer finishes were to be found, decorated enamel, two-tone enamel, polychrome, duo-tone walnut, oak and mahogany and dusty walnut and oak. The trend of finishes as indicated by the Grand Rapids and Chicago markets, is toward duo-tone and lacquer finishes. While duo-tone was noticeable in nearly every display, it was not the predominating finish, while only a few manufacturers were showing pieces in lacquer.

New Developments in Upholstering Field

Some wonderful creations were found in the displays made by the manufacturers of upholstered furniture. It is futile to attempt to describe the attractiveness and comfort-giving qualities of some of these pieces. As usual, the luxurious chesterfields predominated. On the better lines, the spring cushions have been replaced by soft down-filled cushions and pillows. (A series of articles on down-upholstering has been running in the "Canadian Woodworker" for some months.) Another departure noted was in the lines and contour of these pieces. An attempt has been made to get away from the heavy massive appearance which characterizes this class of furniture and by reducing the roll of the arm, sometimes using down pillows instead of spring arm and back, and in other ways giving it an appearance of lightness so that it will fit in better in the average sized room. The duo-tone has made its appearance in connection with upholstered furniture and many attractive color combinations were to be found.

Sizing up the whole market, the furniture displayed was a credit to Canadian enterprise, and while some manufacturers may not be any too well satisfied with the total of orders booked, yet on the whole the total volume of business placed seems to have come up to general expectations. This coupled with the attitude and optimism shown by the dealers argue well for 1922.

K. J. Shirton, retail lumber dealer, Dunnville, Ont., has been re-elected mayor for the coming year.

Furniture Manufacturers to Train Apprentices

Have Their Eye on Possible Shortage of Skilled Furniture Workers—Scheme Being Prepared to Give Special Training to Beginners—Plans Call for Three Year Course

It has been stated time and time again that in the not far distant future the Canadian woodworking industry will be confronted with a serious shortage of skilled mechanics. The younger generation, from which our supply of mechanics for the future must be recruited, seems to have felt the lure of other industries in which the opportunities for immediate gain are greater, and as a result the number of boys and young men who are entering our woodworking factories with the intention of learning the trade, is small.

To counteract this condition and to place the furniture industry in a more favorable light in the eyes of the young men of to-day, the furniture manufacturers of Canada, working through the Furniture Manufacturers' Association, have outlined an apprenticeship course of specialized training which they hope will be the means of inducing a larger number of boys to take up furniture work. The plans call for a three-year course to be given in the different factories and which will tie up with the work going through.

Cabinet-making to Receive First Attention

A start is to be made in the cabinet-making department. A special committee, composed largely of superintendents, men who have had years of practical factory experience, is working out the details of what is to be known as the "Cabinet-making Apprentice Training Course." This course will be open to any employee. Instruction is to be given through a series of pamphlets each dealing with some one phase of cabinet work. These instruction sheets will embrace all the fundamentals of the trade without being too exhaustive. The pupils will be taken step by step through all phases of cabinet work and in all probability in their third year will receive instruction in draughting and designing. The first few lessons will cover tools and their uses.

The course is to be open to boys over sixteen years who, after serving a brief trial period during which they will be paid, will be called on to sign up for the full course. Every effort will be made to make the work attractive and remunerative to those undertaking the studies, and special inducements are to be offered to all who complete the full course of instruction. During the first year the scale of pay under consideration ranges from 12 to 17½ cents per hour. Part of the plan is to see that skilled cabinet-makers in each plant, those who have the ability to give instructions, are selected to supervise and assist the students.

Appeal to Ambitious Boys

It is hoped that this course of training will be the means of attracting a class of young men from whom will spring the foremen and superintendents of the future. It may be that there is splendid material at present in the factories which only needs developing. If so, it will not be overlooked. This offers an excellent opening to ambitious young men who are desirous of fitting themselves for higher positions.

Later on the course of instruction may be enlarged to embrace other departments and perhaps through time will cover every phase of furniture manufacturing from the handling of the raw material to the packing and crating of the finished product. Men trained in this way will have a better grasp of the fundamentals and details of their trade, than if they had just picked it up in a haphazard manner.

Furniture Industry and Lumber Situation

The furniture industry is the largest consumer of hardwood lumber, and in making its purchases has gone to extremes, either buying far in excess of its actual requirements, or going out of the market entirely. Unquestionably the furniture manufacturers bought more lumber than they needed during the first part of 1920, and this demand coming at a time when the production of lumber was at low ebb because of weather conditions forced prices up to an abnormal and unhealthy basis. This was followed by the other extreme; the furniture manufacturers for a long period bought practicallly nothing, which resulted in prices being forced to a basis far below the cost of production, and compelled the shutting down of mills, and the reduction of production to a basis that was not consistent with potential needs.

It has been suggested that the furniture industry has recently embarked upon a campaign of excessive buying, as a decided inclination to buy lumber for requirements far in the future is noted. This is considered ill advised, as the situation is quite similar to that which existed in the early part of 1919. Stocks are comparatively light, there is little chance at this time of the year to increase production, and with any undue demand prices will again advance to an unreasonable level. The interests of both the producer and consumer would be better served by a uniform distribution of this demand. The consuming manufacturer must carry some lumber ahead, but this policy should not be carried to extremes, and lumber should be bought practically as it is needed, and not for speculative purposes.

Furniture Manufacturers' Association's Annual

The annual meeting of the Furniture Manufacturers' Association is scheduled to be held in the Association Board Rooms, Toronto, on Thursday February 2nd, 1922. A number of interesting addresses will be delivered and the election of officers for the ensuing year will take place. This follows a special meeting of superintendents which has been called for February 1st.

Bringing the superintendents of the different plants together in this way is a new departure and it is felt that much good will result. An exchange of ideas among those responsible for the efficiency of the different factories should tend to broaden all who attend. One of the first subjects for discussions is the apprenticeship plan for the training of cabinet makers, which is outlined elsewhere in this issue.

Check Up Your Storm Sash Costs

Have Woodworkers Only Crudest Conception of Costs?—One firm Would Make Large Profit at Figure Another Estimates is Cost.—Where Do You Stand?

The estimates of cost on eleven slab doors published in the December "Canadian Woodworker," have been the cause of considerable comment. It was with a feeling of surprise that many who are following these articles, noticed that there was a difference of over 100 percent between the high and low estimates of cost. If these figures had included varying allowances for profit, this would not be quite so startling, but when it is considered that they represented the ideas (or guesses) of different woodworkers as to the actual cost of these doors, they reveal a lack of cost knowledge that one could hardly believe to be possible in this enlightened age. They also show the need for and value of articles of this type.

One subscriber wrote in saying that he had checked these costs with his own and was satisfied that the actual cost as published was about correct. Another writes that his estimate would have been considerably higher than the real cost as given, but that he cannot see anything wrong with the cost recapitulation as shown. Still others have written commenting favorably on the articles and requesting that the good work be continued.

Not a Semblance of Uniformity

The number of plants properly equipped for the economical production of slab doors is small, and this may be one reason for such a marked difference in the figures submitted. That cannot, by any means, be applied to the manufacture of storm sash, yet according to the cost estimates published herewith, the variation is almost as great. Here is a simple job, 38 storm sash; yet no two woodworkers agree as to their idea of cost.

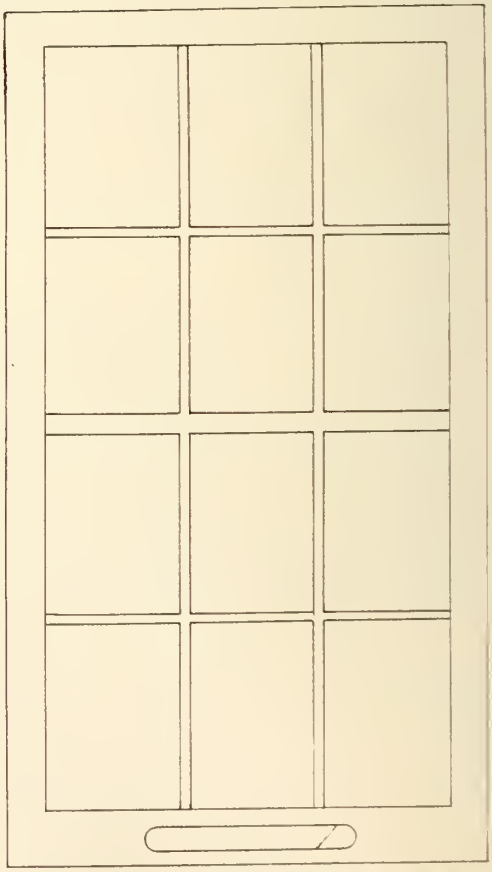
The figures shown this month give more detailed information as they give the estimated amount of material and estimated waste in addition to covering other phases of the work. This additional information only tends to emphasize and accentuate the different ideas as to quantities, time, values and waste, which exist in various plants. It is strange, to say the least, when out of twelve woodworkers who submitted cost estimates, only two agree as to the amount of material required and their survey of 550 feet exceeds by 125 feet the figure given by the firm which did the job.

List of Estimates Submitted

sEstimate	Material	Feet	Waste	Bench	Machine	Priming	Total
1	$59.65	530	25%	52	34	$22.00	$173.70
2	53.35	494	20	19	38	20.00	164.40
3	47.17	510	32	30	28	10.00	157.15
4	39.63	490	10	36	42	13.00	151.65
5	54.00	470	15	25	25	19.00	140.10
6	36.30	550	10	25	41	22.50	131.45
7	37.15	460	20	22	32	12.00	124.75
8	43.70	475	15	18	27	16.50	119.10
9	**41.37**	**426**	**25**	**14**	**21**	**14.50**	**111.02**
10	50.41	550	30	14	19	7.60	108.19
11	33.75	410	20	24	29	9.00	104.20
12	32.20	400	15	17	17	11.50	97.85

What is wrong? A certain amount of judgment may have to be used in fixing the time required to complete a specified piece of work, but the amount of material going into any piece of work can be accurately calculated and should not vary in different plants. What do we find? One woodworker estimates that it would require 550 feet of pine to make the 38 sash in question. Another says 530; a third 510 and then on down the list 490, 460, 425 and400, a variation of 37 percent in material alone. When woodworkers do not agree on such a fundamental as the quantity of material required for a simple piece of work, it is not so difficult to understand why they seldom agree on prices.

The waste column affords an interesting study in itself. Two allow 10 percent, three 15, three 20, two 25, one 30 and one 35. On a job of this kind the waste should not run very high, not over 20 or 25 percent. An allowance of 15 percent is not high enough to cover the actual waste, while 30 and 35 percent allow for too great a leeway. If a person will keep close tab on the material worked up, it will be found that on the general run of work going through a sash, door and general woodworking plant, the waste will average in the neighborhood of 30 percent, but will show a marked variation on the different classes of work. The estimator must display good judgment in fixing the waste allowance. Coming to hours, it would appear as if some of those responsible for these figures have but the haziest notion of the length of time required



Storm sash, 24—2 ft 8 in. x 8 ft 2½ in. x 1⅜ in., 12 light, 11—2 ft. 4 in. x 8 ft. x 2½ in. x 1⅜ in., 12 light; 3—2 ft. 4 in. x 4 ft. 2½in. x 1⅜ in, 6 light. Bottom rail bents, standard bars and rails, primed one coat.

to complete such a simple job. One allows 85 hours for bench and machine work, another 33, a third 34 and a fourth 78. It seems to be of little avail to ask why, for there is no reason for such wide discrepancies. Just wild guessing. This is simple work, sticking, mortising, tenoning and sanding. Nothing complicated, no elaborate machine set-ups, nothing to require a lot of time. If the "Canadian Woodworker" were to venture an opinion, it would be that the smaller time allowances are about correct. Forty-one and forty-two hours mean four days of machine time to prepare and sand this lot of stock. Can't see it.

How Cost Figure is Made Up

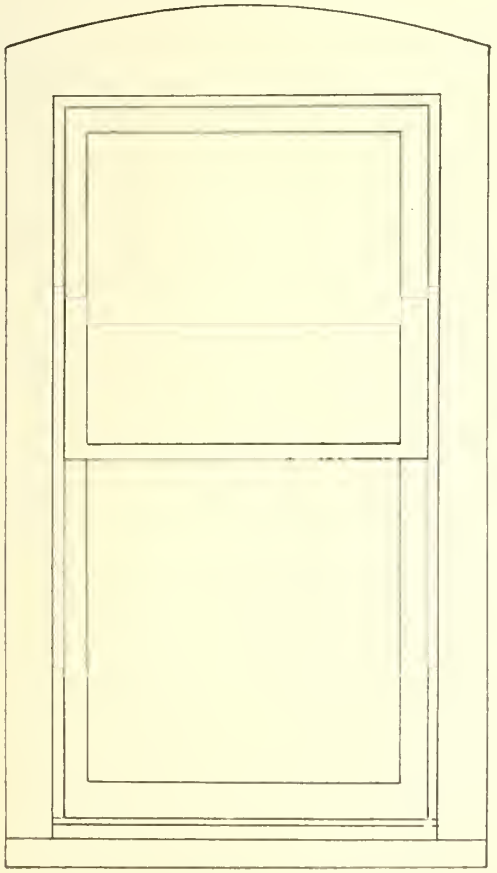
The estimate shown as No. 9 which is the one submitted as an accurate recapitulation of the cost of the storm sash, is made up as follows:—

Material		
426 ft. sash pine @ $75.00	31.95	
38 Bottom Vent Slide .03	1.15	
	33.10	
Add 25% waste	8.27	
		41.37
Labor		
Machine 20.10 hrs. @ $1.20	24.20	
Bench 11.25 " @ .90	10.25	
Helper 3.40 hrs. @ .60	2.20	
		36.65
		14.50
Priming (including paint)		14.50
		92.52
Plus 20% Commercial Burden		18.50
Total cost		111.02

If estimate No. 9, which is the one submitted by the woodworker who did the job, is anywhere near correct, factories 1, 2, 3, 4 and 5 could make a nice profit working at cost, while No's. 11 and 12 would have to add at least 30 percent to come out on the right side of the deal. When such large discrepancies exist on such simple work, it makes one wonder what the differences would be on a really complicated job. Is it any wonder that those in need of woodwork feel inclined to shop around. They usually find someone willing to do the work for about half what the others want.

The February "Canadian Woodworker" will contain a cost study on frames and sash, as shown in the accompanying sketch. The specifications are 13 box frames, brick opening, 3ft.-6in. x 6in.-0, 1¾in. two light sash. These frames are standard, that is 7/8in. pulley stiles, 7/8in. inside and outside casings, 1⅜in. hanging stiles, 2in. x 6in. sills and cambor head. Here is a common every-day job. How does your idea of cost compare with others in the industry? Don't wait to be asked for cost figures but work out your cost estimate giving material, waste, bench and machine hours and commercial burden and send it in. Do it now.

Next Month



Next month estimates of cost will be published on 13 box frames and sash, brick opening, 3 ft. 6in. x 6 ft. 1¾ in. 2 light sash. Send yours in.

Grand Rapids and Chicago Markets

The furniture exhibitions, which were held recently at Grand Rapids and Chicago, brought out a large number of retail buyers; in fact the attendance was all that was expected. Better still, those who visited the shows came prepared to buy and prepared to pay the prices asked.

Last January, it will be remembered, the buyers made a concerted effort to break the market and secure lower prices. In this they were more or less successful. This year they seemed to realize that prices have been reduced as low as is consistent with present costs, and they are giving more attention to design and finish than to the price factor. When they came across a suite or piece of furniture which they thought would appeal to their trade, there was no hesitation about placing an order.

The majority of the manufacturers were showing some new designs, in addition to their standard lines. This new furniture showed a marked departure from the idea of slavishly reproducing period designs. While the various characteristics of period furniture were not lacking, the designs were more individualistic, that is, the designers seemed to have permitted themselves greater latitude in outline and ornamentation.

Walnut seems to have held the centre of attraction, with oak and mahogany close second. Polychrome and enamel finishes were not so numerous as at recent exhibitions, their places being taken by duotones and some of the more popular lacquered finishes. The demand for a Polychrome and for decorated furniture seems to have eased off.

Messrs. Berkey & Gay, of Grand Rapids, showed a rather unusual suite in what they call their "No. 1776." As the year 1776 witnessed the Declaration of Independence, the suite bearing this number was designed to represent the American nation. Each individual piece going to make up the suite, was different in design and detail from the other pieces, yet the whole effect was harmonious and attractive, each piece seeming to blend in with the rest. This represented the fact that America takes the various classes of foreigners which come to her shores and educates and develops them and welds them together into one united and harmonious nation.

The Treatment of Depreciation in Production

Simple Method of Figuring Depreciation—How Calculations are Made and Applied—Method of Keeping Depreciation Account

By E. W. McCullough, Manager, Fabricated Production Department, Chamber of Commerce, Washington

[Concluded from December issue]

Another matter to bear in mind is that your estimate of depreciation rate and the useful life on which it depends are not necessarily final. Things have a way of lasting longer than anticipated, while, on the other hand, unforeseen circumstances bring the usefulness of equipment to an untimely end. When it becomes plain that the life of the property becomes over or under estimated, re-life your property and revise your depreciation rate accordingly.

Intimately connected with the accounting for depreciation is the method of depreciation. Accountants have suggested numerous methods of charging depreciation; sinking fund, declining balance, fractional method-weighted years, etc., each with special advantages and strong points, but for firms who heretofore have had no consistent depreciation policy and wish to adopt one, the fixed percentage or straight line method is suggested. It has been shown that when production is abnormally high or low modification of the straight line method is sometimes necessary but, on the whole, this method is the simplest. The straight line method calls for equal annual depreciation deductions and assumes that the rate of depreciation is uniform during the entire life of the property.

To illustrate the fixed percentage or straight line method of depreciation:

A machine cost $120. Its estimated salvage or scrap value at the end of its usefulness is $20. It has an expected normal useful life of 10 years. Deducting the salvage value from cost, we obtain a remaining sound value of $100. This divided by the expected years of usefulness gives a depreciation of $10. Expressed in terms of a formula:

$$\text{Annual Depreciation} = \frac{\text{(Cost New — Scrap Value)}}{\text{Useful Life}}$$

Should be Adequately Recorded

It is not usual to find assets grouped under such general captions as Buildings, Machinery and Equipment. The term "Buildings" may include wood, concrete, steel or brick structures designed for heavy use or light, may include fencing and wood bins, drainage systems and docks. The term "Machinery" may comprise electrical generators and steam engines, hydraulic presses and steam hammers, lathes, planers and boring and milling machines, woodworking machinery and small tools. The "Equipment may vary from a locomotive train to pickling tanks, from glass furnaces to fire systems. The span of usefulness of these assets may vary from three years to thirty-three, yet all will bear a 3 per cent, 5 per cent or 10 per cent rate of depreciation, nor will it be possible to determine the depreciation record or history or the undepreciated value of any specific unit or type of property.

A classification of property is a prerequisite to the proper record of depreciation. Tax regulations, as well as ordinary accounting property, require that the allowance for depreciation should be computed and charged off with express reference to specific items, units or groups of property, each item or unit being considered separately or specifically included in a group with others to which the same factors apply. Hense a proper record of depreciation requires that the specific items and units of property be enumerated and classified by kind, group or department, and that their original cost be ascertained, as well as the accumulated depreciation and the remaining useful life.

To do this will not be easy for an established concern accustomed to taking depreciation on a general grouping of property, such as Buildings or Machinery, and for such a concern "the splitting up and allocation of the old capital outlay must be approximate." Such allociation will, however, be greatly assisted by a competently made appraisal.

How Facts May be Secured

A complete record and history of depreciation as well as of plant and equipment can be secured through the property ledger, which aims to do for plant and equipment what the perpetual inventory record does for stock on hand.

Such a property ledger will tie up with the general books of account, and will supply the detail for the total cost of property, the depreciation written off in any one year, the additions, renewals and disposition of property, the amount in the depreciation reserves, the estimated scrap value, and the net remaining sound value of property.

In addition, the property ledger will contain a brief description of all property, where located, plant identification, the name of manufacturer and manufacturer's number, from and when purchased, the total cost, including freight and installation charges, the estimated useful life of equipment and rate of depreciation, and it may likewise have a record of repairs, replacement values and a tabulation of monthly depreciation.

The property ledger can be conveniently compiled in card or loose leaf form, and each card or sheet ought to last from twenty to thirty years. Practically the same form can be used for departmental and final summaries of plant and depreciation. The complete financial, plant, and the performance history of each item of property secured in this way guides future outlays upon plant, helps the accurate determination of loss or gain on specific assets, is of some importance in credit applications, simplifies the compiling and checking of tax and annual statements, and is invaluable in the event of a fire loss. The surprising thing is that there is still a comparatively large number of concerns operating without such a property ledger.

How Depreciation is Calculated

The arrangement of the form of property ledger as well as its size, etc., will depend on the ingenuity of the executive or cost accountant designing it, as well as upon his sense of what is important information for his particular requirements, industry or plant. It may be desired to compress all the information on a small card, using both sides, or it may be considered wise to keep track of monthly depreciation, the cost of repairs or replacement values. These are merely details to be adjusted to and by individual needs.

To illustrate the use of the property ledger, it is supposed that a 50 H. P. Steam Engine in purchased from Evans and Clark for use in the Trimming Dep-

artment. S. E.-T. 1799 is its plant number, S. E.—symbol for Steam Engine, T. for Trimming Department. This plant number appears on the name plate of machine where it can be easily seen. If the asset is frequently moved about the plant, it will be given a location number. The manufacturer is the Brighton Engine Co., the manufacturer's number B-93217. Its useful life has been determined at 15 years. The invoice for the engine comes to $2500, freight charges $15, installation $185, a total cost as of January 1, 1921, of $2700. The scrap value is computed at $150, leaving a wearing value of $2550, and an annual depreciation of $170, arrived at by dividing the wearing value by the useful life of 15 years.

The record of the engine is as follows:

1921.—Normal depreciation of $170, no additions, no renewals. At the end of the year there will be $170 in the depreciation reserve and a net remaining value of $2380. (Wearing value $2550 less depreciation reserve $170).

1922.—Normal depreciation of $170, no additions, no renewals. At the end of the year there will be $340 in the depreciation reserve and a net remaining value of $2210.

1923.—Normal depreciation of $170, no renewals, an addition in the way of a lubricator, installed Oct. 8, at a cost of $150. At the end of the year there will be $510 in the depreciation reserve and a remaining value of $2190. (The former wearing value of $2550 has been increased $150 to $2700, by the cost of the lubricator; $2700 less $510 in depreciation reserve, leaves a net wearing value of $2190).

1924.—The normal depreciation has been increased to $182.50. This is arrived at by dividing the new remaining value $2190 by the remaining useful life of 12 years. No additions, no renewals. There is accordingly at the end of the year $692.50 in the depreciation reserve, and a net remaining value of $2007.05.

1925.—Normal depreciation of $182.50. Other things being equal, there would accordingly be $875 in the depreciation reserve at the end of the year, and a net remaining value of $1825, but on July 12 the old piston has been replaced by a new one costing $300. This $300 is charged against the accumulated depreciation, reducing that to $575, and increasing the remaining value by just that much to $2125.

1926.—At January 1, 1926, the asset has been in use five years. Its remaining useful life accordingly would be ten years, but the replaced piston, etc., it is assumed, prolongs the useful life two years, and the remaining useful life of the asset is correspondingly changed to twelve. This remaining useful life, twelve years, divided into the remaining value, $2125, gives a new annual depreciation charge of $177.08. At the close of the year, the depreciation in reserve will amount to $752.08 and the remaining value $1947.92.

1927—On the tenth of January the machine sold for $2000. On the proper page of the journal an entry corresponding to the following will appear:

Cash	$2000	
Reserve for Depreciation	752.08	
Profit and Loss	97.92	
Buildings		$2850

The sales price, $2000, plus the accumulated depreciation, $752.08, $275..08 deducted on the transaction.

A notation can be written in red ink across the face of the property ledger page, or the items of cost, scrap and wearing value, depreciation reserve and remaining value closed out.. At all events, the page will be taken out and filed in the rear of the ledger.

This hypothetical history is given to show how the property ledger operates and by what manner of contingencies it is affected.

A. D. F. Campbell, of A. F. Campbell & Son, woodworkers and retail lumber dealers, Arnprior, Ont., was re-elected by acclamation a member of the council of that town for 1922.

ITEM *Engine* MANUFACTURER *Brighton Engine Co* USEFUL LIFE *15 Years*
DEPT. *Trimming* MFRS. NO. *B-93217* as of 1/1/26 *12 Years*
PLANT NO. *SE-T-1799* PURCHASED FROM *Evans & Clark-Order No 3906*

DATE	DESCRIPTION — REMARKS	REF.	TOTAL COST	SCRAP VALUE	WEARING VALUE	ANNUAL DEPRECIATION	IN DEPRECIATION RESERVE	REMAINING VALUE
1921 Jan. 1	50 H.P. Engine — Invoice	V 731	2500 —					
	Freight	V 729	15 —					
	Installation	V 741	185 —	150 —	2550 —	170 —	170 —	2380 —
			2700 —					
1922						170 —	340 —	2210 —
1923						170 —	510 —	2040 —
Oct. 9	Lubricator installed	V 791	150 —		150 —			150 —
			2850 —		2700 —			2190 —
1924						182 50	692 50	2007 50
1925						182 50	875 00	1825 —
July 12	Piston replaced	V 907					(300 —)	300 —
							575 —	2125 —
1926						177 08	752 08	1947 92
1927 Jan. 10	Engine sold - $2000. loss $97.92							

Showing how Property Ledger Accounts may be kept

The Commodious shed in which stock isend piled

Does Not Sit Down and Wait for Business

Unusual Display Facilities Effected Through End Piling of Finished Material—Find Motor Truck Particularly Desirable—If Business gets Slack Build a few Houses to Keep Things Going

One of what might be termed the progressive type of woodworker is found in the person of D. C. Baird, of St. Mary's, Ont. He has been at the game ever since he was a little shaver, has grown up with it in fact. Shortly after leaving school Mr. Baird entered the plant of Brown & Co., St. Mary's, to learn the trade of bench carpentering. For this he received the munificient sum of $3.00 per week. After working at the trade for a few years, he was taken into partnership, acquiring an interest in the concern. He severed this connection two years later to engage in the manufacture of wood boxes.

The original box industry has been expanded and extended so that now, the business comprises a box factory, a planing mill and a retail lumber yard. The box plant is kept busy manufacturing butter boxes for creameries and butter factories. These boxes are made of spruce, entirely, as it has been found that any other kind of wood tends to taint the contents. Two sizes are made, the 45-pound and the 60-pound size, the specifications being 8″ x 14½″ x 14½″ and 8″ x 14″ x 19″ respectively. For shipping, the boxes are nested, one box being placed on top of another, while inside there is a third standing on end. A nail driven in each side holds the upper and lower ones to the centre box. In this way, considerable space is conserved.

May Change to Electricity

The equipment of the box factory consists of resaw, four-sided planer, cut-off saw, rip saw, disc sander, dovetailing machine and nailing machine. Power is furnished by a 35 H.P. Goldie & McCulloch steam engine. The shavings are conveyed to the boiler room where they are used for fuel. Mr Baird is considering changing to the electric drive.

Off this plant is the carpenter shop where such articles as sash, doors, frames, are assembled and finished. Beneath this is the planing mill where all kinds of woodwork and general custom work is done. Contracts are taken for the complete woodwork for houses, stores, office buildings and other forms of construction work.

Fine Storage Facilities

In connection with the plant is what is considered to be one of the finest dressed lumber storage sheds in Canada.

It is 90 feet square and constructed of sheet metal siding to conform to the building by-laws of the town,

D. C. Baird, St. Mary's, Ont.

and covered with prepared roofing. The building is on a cement foundation, with cement piers running the full length of the sides and also under the flooring

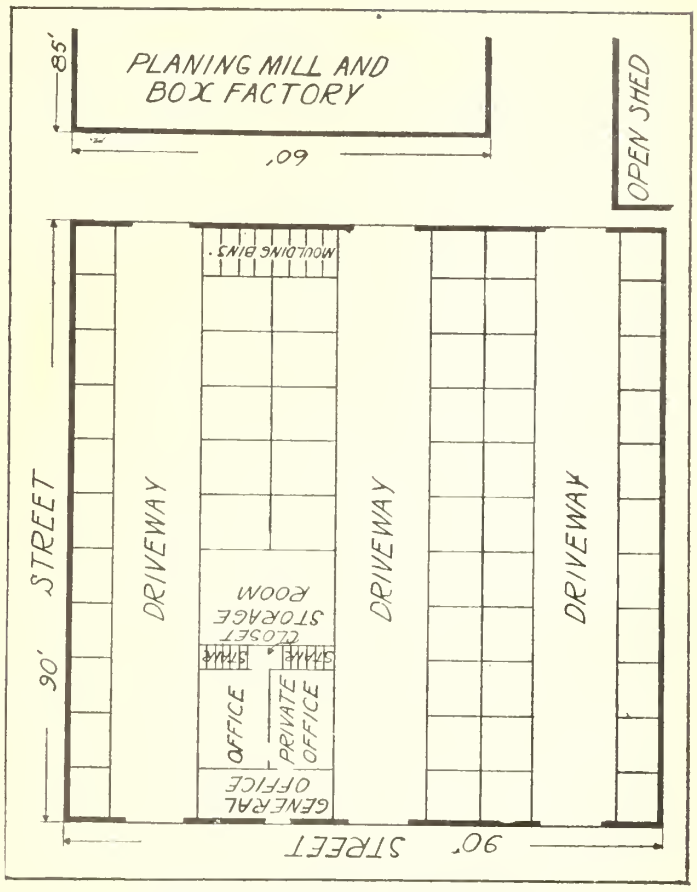
on which the lumber is piled. There are three driveways or lanes each of 13 feet width in the shed, and entrance is gained through large sliding doors. Lumber in all lengths up to 18 feet on the outside and 24 feet in the centre is piled on end in the various stalls, which are eight feet square. Underneath the plank flooring is a 3 foot air space, which is tiledrained and allows free circulation of air.

In the centre at the front of the building is the private office of Mr. Baird, as well as the general office, both of which are panelled and finished in B. C. fir. The interior is attractive and inviting. Just back of the office is a garage for the automobile of the owner, and upstairs is a large stock-room, where are kept the doors, sash, windows frames, newel posts, verandah posts, mouldings and other factory material. The building throughout is electrically-lighted and the office quarters are heated by steam from the exhaust of the planing mill..

Advantages of End Piling

Commenting on end piling, Mr. Baird says it may be to some extent new in Ontario, but it has been followed for a number of years in the West with most satisfactory results. The advantage is that a customer can see the lengths, the knots, the grain or any good or any bad points when buying. He can also see the various grades of lumber, the different kinds, etc., for he has in front of him a complete representation of the stock carried by the dealer. In other words, he can fully examine the goods before purchasing. Lumber is also more easily and economically handled when piled on end, dries more quickly, is displayed to better advantage and requires less labor for loading or unloading.

About six years ago Mr. Baird inaugurated what was then considered a novelty, in the shape of a motor truck delivery. He operates two, one and one half ton trucks, which, by-the-way, are usually loaded to two tons. As yet there has never been any trouble in handling this weight around the town, which is very hilly. Mr. Baird considers that trucks are preferable to horses for carting purposes, being cheaper both as to upkeep and saving of time and labor. The trucks are used for delivering lumber and boxes and also in loading or unloading cars of lumber. The distance from plant to station is about a mile. With horses it took one and a quarter hours for every trip to the station with a load of lumber, whereas the trucks make it in three-quarters of an hour. Trips as long as 25 miles have been made with a truck loaded with boxes. There has thus been accomplished in five hours' time something which could not be done with horses at all. It has been found that it is easier to get men to run trucks than to drive horses, and that the repair bills on the trucks are very light.



Plan of Storage Shed for dressed stock

A new departure was made in 1921 in building houses. During certain periods business was found to be slack. In order to keep the men at work and the organization intact, Mr. Baird decided to take a hand at house-building. A number of attractive bungalows were erected and it is his intention to put up others during 1922, thus giving practical expression to the "Build Now" slogan so often heard.

Motor truck and trailer for delivering woodwork and lumber

Are Your Dry Kilns Giving Satisfaction?

Shorter Drying Periods Increase Risks Requiring Greater Care in Operation—Operator of More Importance Than Equipment—Few General Rules for Intelligent Manipulation of Dry Kilns.

By C. A. FIELDS, Toronto*

Are You Interested in Kiln Drying?

From observations made and information gleaned at various plants, the "Canadian Woodworker" is convinced that the woodworkers of Canada are not meeting with the success they should in their drying operations. This may be due in part to the equipment used but the degree of intelligence with which the kiln is operated, plays an important part in results secured. Lumber drying might be termed a basic operation and upon it depends, to a large extent, the success of succeeding operations, and in some cases the quality of the product. Dry kiln operators and the owners of dry kilns do not seem to have kept up with all the developments which have taken place in the kiln-drying field, or if they have, little or no attempt appears to have been made to apply such information to their drying. To this end the "Canadian Woodworker" has arranged to run a series of practical articles dealing with all phases of dry kiln work. These articles are being prepared by practical men who know their subject, and we believe will prove of inestimable value to our readers. Don't miss one. The first appears herewith.—The Editor.

Dry kilns are very much like automobiles; there are many types, many makes, some new and up-to-date while others are nearly worn out. However, the large variety of autos does not compare in numbers to the many different types of drivers,—the human hand at the wheel—each individual having his own peculiarities, but all intent upon the one thing, namely, getting to his destination. So, in turn, we have a large number of dry kiln operators, all perhaps varying to some extent in their theory of lumber drying, but each intent upon the same object, that is, drying his stock in the best possible way, in the least possible time and with loss through degrade reduced to a minimum.

Perhaps in the past more credit was given to the dry kiln for the success of its operation than the apparatus may have merited. To-day woodworking manufacturers are beginning to realize that there are two important phases to the matter of successful dry kilning,—that is, not only the proper type of kiln for their own particular requirements but also an operator who understands the science of wood technology and the working principle of kiln operation. In fact, the two factors are inseparable—with one missing we can not hope to attain the highest point of efficiency in this important phase of the work. In a way, the proper operation of a kiln is more important than the apparatus itself. Now, I do not want to detract from the importance of having a good dry kiln—but of the two evils, a poor kiln or a poor, inefficient operator, perhaps the former is the lesser. An expert operator will get fair results from an inefficient kiln,—I say fair, not even good, let alone the best,—while an up-to-date efficient kiln may give but poor results under the control of an inexperienced man. However, either way we take it, the combination is a poor one and should not be allowed to exist. It is therefore up to the operator to improve himself.

The success of the old type of dry kiln depended not only upon speed and quality of production but also upon their inability to dry lumber at a rate that would injure the stock. Speed was a secondary matter, so if it took two to four weeks to get lumber out properly, little thought was given to the time factor. Production to-day calls for a far greater output from each and every machine, which in turn requires dry kilns able to produce properly cured lumber in the least possible time. Such a change in equipment was followed by improvement in kiln operation, which revolutionized many of the old theories. This brings us to a better realization of the importance of the dry kiln operator.

Faster Drying Means Greater Risks

Going back to our symbolical comparison of the auto and kiln, it is one thing to drive a light, low powered car but altogether a different proposition to take the wheel of a high powered, specially built racer. Put the average light car driver into the finest, most up-to-date, high powered machine, with all modern conveniences of control, and turn him loose with out proper instruction and what is very apt to occur? Power means speed, and speed increases risk, the increased responsibility of which can be borne only by those specially prepared to carry it So with a modern, high powered drying apparatus, it requires an operator who understands the working principle of his kiln, along with practical knowledge as to the theoretical and practical technicalities of lumber drying.

The operator should regard the dry kiln as a machine which will maintain any set of drying conditions he may consider, either from experience or upon advice, to be proper for the condition of the lumber.

This kiln should contain equipment for producing heat, humidity, circulation and ventilation: ample in size, flexible in arrangement, properly distributed and adequately controlled. It is in effect like an auto mobile, with plenty of power, speed and road ability, and exactly similar to the automobile in that it depends largely on the operator (driver) for efficient performance. It is therefore the operator's duty to make himself an efficient "driver" of the dry kiln.

Responsibility of Operator

More lumber can be ruined with the present types of dry kilns if not properly operated, than with the old types. Modern methods resulting in fast drying makes necessary the training of our kiln operators.

*Canadian representative, National Dry Kiln Co., Indianapolis.

This branch of the woodworking industry is receiving more attention and dry kiln operation is becoming a profession instead of a job. Some manufacturers, rather than hire an outsider who has been specially educated to this profession, take it upon themselves to bear the expense of sending their operators to some school or laboratory for a special course in dry kiln operation. Such a move is highly commendable and the results are usually well worth the cost. Many operators are rusty and need such a training. However, it is quite often left to the ingenuity of the individual to acquire the desired knowledge and then to keep up to date in the pursuit of his vocation.

The dry kiln operator is responsible for the success of one of the most important phases of commercial manufacturing. It is very essential that he shall regard himself as a willing and working helper in making his factory turn out the best furniture or auto body or interior trim or what not, in the world. He should recognize that it is the function of the organization of which he is a part to make every phase of the manufacturing process one-hundred per cent efficient, if possible. His part in directing the initial process of manufacture should appeal to him as perhaps the most vital part played by any member of the producing personnel.

His dry kilns are, as it were, the gateway to the factory. Quantity of production often depends on the amount of dry and properly conditioned lumber which he can deliver to the cutting room. Quality of finished product starts with quality of dried stock. No amount of excellent or careful workmanship can make a really good article out of an improperly conditioned piece of lumber. On the other hand, even poor jointing and machining can often be camouflaged in the finishing room, if the lumber is really in prime condition and will hold its dimensions and form.

A Few Simple Rules

A great amount of literature has been written upon drying methods and kindred topics. To discuss this subject fully would necessitate details of too great a length. Nevertheless, there are a few general rules, which apply in a practical way, to all kiln operations. I shall list a few of the most important of these which should be observed, if the lumber is to be properly conditioned, in the least possible time and with a minimum loss.

The operator should make careful test readings and records, both before and during the drying of the lumber.

Tests should be made to determine the moisture contents of the stock before entering the kiln. Such a test will give the operator data on which to base his treatment of the lumber.

Tests should be made at stated intervals during the drying periods. For this purpose test boards should be inserted in the kiln trucks, from which samles may be taken. Always try to get an average representative sample. Pick out a good solid, heavy piece or, better still, take two or more sections out of as many different boards and take them out of the pile one-third of the distance from the bottom (the top pieces may be drier than the bottom pieces). If two or more tests are made for moisture, it is safer to operate according to the high moisture content rather than according to the average of the pieces.

At the same time tests are made for moisture content, the operator should make tests for case-hardening. If the lumber becomes case-hardened in drying, it practically stops the drying process, or at least slows it up to a great extent, frequently resulting in hollow-horning, cupping, internal strains and many other evils which effect the stock throughout the entire manufacturing process.

The operator should keep a record of the various runs, showing processes followed. Such a record should note the temperatures, humidities and degrees of ventilation used from time to time. These records will be valuable in many ways, and in case of trouble will show where the trouble may have occurred. Recording a successful operation will enable the operator to repeat and secure similar results on subsequent occasions. A record should be kept showing the condition of the lumber at intervals of twelve or twenty-four hours, from the time it was put into the kiln until the drying is completed. This record should state moisture content and should remark whether or not case-hardening, checking or hollow-horning was apparent.

With the proper type of kiln, that is, an apparatus ample in power, flexible in arrangement, properly distributed and adequately controlled and with an operator who will diligently and intelligently follow general rules and instruction it will be possible to do anything with the lumber that it will stand. Speed is then only a matter of the operator's individual ability. I would recommend that the operator acquaint himself in a broad way, at least, with the technical data available on the subjects of forestry and wood technology. He should at least be familiar enough with these subjects to recognize the condition of the lumber as it gradually dries.

Why Lumber is Steamed

From the questions asked by numerous students taking the short courses in kiln drying at the Forest Products Laboratory, Madison, Wis., it is evident that many who operate kilns and handle lumber do not understand the object of steaming lumber in a kiln. There seems to be a common impression that the purpose of steaming lumber is to "remove the sap." This is far from being the fact, for when lumber is steamed it takes on moisture, as a rule, instead of giving off anything.

The reason for steaming lumber during drying depends on when it is done, but nearly always the treatment is given for one of the following purposes: (1) to heat lumber through quickly at the start; (2) to relieve stresses which otherwise would produce checking, casehardening and honeycombing; (3) to equalize the moisture content and condition the lumber ready for use at the end of the run; (4) to kill fungi and insects in the wood.

When lumber should be steamed, how long the treatment should last, and what temperature should be maintained, are points which have been determined at the Forest Products Laboratory by experiments on many species of wood. A thorough understanding of the steaming operation is essential, because the whole kiln charge can easily be ruined by too severe a treatment. One of the chief needs of many commercial kilns is proper steaming facilities, without which a high degree of success in the artificial seasoning of wood is impossible.

Furniture Manufacturers Win Civic Honors

H. R. Magwood, F. E. Coombe Furniture Co., Limited, recently elected Mayor of Kincardine, Ont.

A. E. Malcolm, Andrew Malcolm Furniture Co., Limited, Kincardine and Listowel, who was re-elected mayor of Listowel, Ont., recently.

The Folly of Low Prices

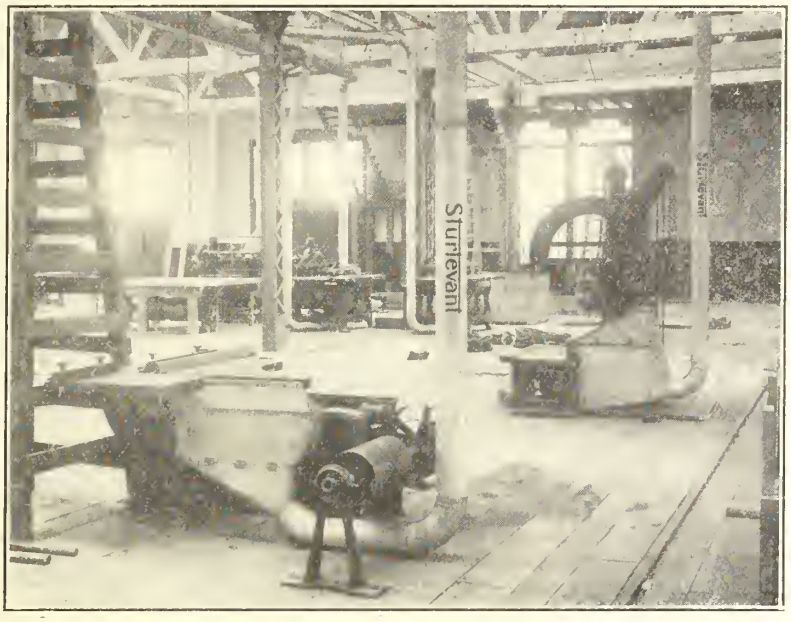
The millwork business is in poor shape to-day because many firms are cutting prices, presumably to beat competitors, yet little additional business is resulting. Sales at a living profit are necessary, otherwise the buying public takes the whip hand, just as they did during the agricultural implement war, and the producer faces bankruptcy. The millwork industry may be a big enterprise, but it is no more safe on an unsound merchandising basis than the smallest bank in the country. Cost, plus overhead, plus a profit is the foundation upon which it must go forward or call in the receiver. There has been much scheming and unfairness on this vital question during the past several months. The directors blame it on the sales manager, and the salesmen blame it on conditions, and conditions are nothing more than cause and effect of merchandising. The policies of merchandising are usually created at the sales manager's desk, and as a rule that is where the blame belongs.

Electricity for Beginners

To those interested in electricity, a book entitled "Practical Electricity for Beginners," which has recently been published by the Manual Arts Press, Peoria, Ill., should prove of interest. This work is a combined text book and shop manual and deals with the different phases of electricity as applied to the home. Dry cells and storage batteries are also touched upon. A review of the chapter headings will give a fair indication of the ground covered. These are,—"Electricity and Electrical Currents;" "Electric Conductors and Insulators;" "Electrical Pressures;" "The Flow of Electrical Current;" "Electrical Circuits;" "Battery Lighting Circuits;" "The Heating Effect of Electrical Current Fuses and Their Purpose;" "Heater Circuit Troubles; how to Detect and Remedy Them;" "Incandescent Lamps and Their Use;" "The Operation of Electrical Lamps;" "Electrical Measurements;" "Dangers in Using Electricity and How to Avoid Them." The subject is covered in a clear, concise manner and is well illustrated with sketches. To those who take a pleasure in tinkering around and looking after their own lighting and heating circuits, the facts here present on construction and repair should be found helpful, not only in saving expenses but also in eliminating annoyances and delays. The price of the book is $1.00.

Facts About Canada

Few people realize that 26,445 Canadian ex-service men have been established on the land and are nearly all making good; that Canada's waterpower development represents an investment of $475,000,000, while the power produced would otherwise require 18,000,000 tons of coal yearly; or that nearly 88 per cent of the world's supply of asbestos comes from the Province of Quebec. The Natural Resources Intelligence Branch of the Department of the Interior, has just issued a revised edition of "Compact Facts", which contains in concise form, information regarding Canada; its area, population, trade and industries; their extent, capital invested, wages paid, values of live stock, principal crops and amounts produced; mineral resources and present production; also forest resources and forest products. Copies of the booklet are available on application to the Superintendent, Natural Resources Intelligence Branch, Department of the Interior, Ottawa.



Dust collecting system on planers in C.P.R. Angus shops, Montreal.

Exhaust Systems for Woodworking Plants

Feeding Refuse Direct to Furnace—Should Be Maintained in Perfect Condition—Keeping Power Consumption Down to Minimum

By H. M. Nichols, B. F. Sturtevant Co., Boston.

[Concluded from December issue]

The stresses and strains on exhaust fans in woodworking systems are unusually severe as not only light dust, shavings and sawdust, pass through them but they are also compelled to stand up under the heavy blows of knots and large wood slivers striking the rotating blast wheels at speeds of over a mile a minute. The fans used for this work are known as "planing mill exhausters". Heavy steel plate is the best material for the roundabouts, side plates and cones, as cast iron has been known to crack under the severe blows which these parts receive. The casings should be well braced with angle iron in order to obtain the necessary stiffness and rigidity. Extremely heavy cast iron hangers, having a wide spread at the base, are necessary to take the belt pull.

There are two methods of driving the fans, belted and direct connected to motor. Belt drive is usually preferable because of its flexibility and the ease with which the speed can be changed to accommodate the systems to changed operating conditions or increased capacity.

Where long shavings or stringy materials are handled special non-choking open type blast wheels should always be used. Double exhausters are installed where head room is scarce or where the main pipes come from opposite directions. In the latter case elbows and bends are eliminated as the main pipes are run directly to the fan inlets.

Centrifugal Type Collector

The centrifugal or "cyclone" type collector is commonly used for separating the shavings and sawdust from the air. In this type of separator the mixture of air and shavings is introduced on a tangent, near the cylindrical top of the collector and the whirling motion sets up a centrifugal action causing the comparatively heavy material suspended in the air to be thrown against the side of the separator, from which position it spirals down to the tail piece, while the air escapes through the stack at the centre of collector. Special construction is sometimes required for fine dust, also some blow pipe manufacturers use a special type of collector for furnace feed, the object being to deliver the material to furnaces as uniformly as possible.

Where more than one fan delivers into a single collector a back-pressure valve is required to prevent one fan blowing back through the other in case the second fan should stop for any reason.

Collectors are sometimes arranged in parallel and by means of a percentage valve the refuse can be delivered to either one at will, while the air is distributed to the two. Special collectors are also furnished for separating sawdust from theshavings.

Feeding Direct to Furnace

In most plants where the refuse is used for fuel, it is delivered by gravity directly from the collector to the furnace. The discharge pipe leading from the bottom of the collector is divided and the junction furnished with a switch or valve so arranged that when the material comes too fast for the fires it can be diverted into a reserve bin.

The furnace feeder should be hinged where it is attached to the lower end of the discharge pipe in order that it may be disconnected from the furnace when the fan is shut down. Also great care must be taken to provide an absolutely tight switch. Other-

wise when discharging refuse to the storage bin, fine sawdust will sift through this valve and settle in the furnace feed pipe, and in case the fireman has neglected to disconnect the feeder from the furnace, the flame may flash back following this train of fine sawdust, into the dust collector.

Much more attention is being given to the problem covering the economic burning of this refuse than in years past, when fuel was so cheap, and special grates, stockers, etc., have been developed, with which considerably better combustion efficiencies are obtained.

Connections for Wood Working Machinery

....The following table is intended to give a general idea of the size of connections often used with woodworking machinery. .This table, however, should be used only as a guide as the proper size connections depend on quality of material, kind of lumber, its condition, whether wet or dry, rate of feed, etc. .....

Type of Machine.	Dia. of Connections.
Circular Saws 12" dia.	4"
" " 12"—24" dia.	5"
" " 24"—40" dia.	6"
Band Saws Blade under 2" wide.	4"
" " " " 2"—3" wide	5"
" " " " 3"—4" "	6"
" " " " 4"—5" "	7"
" " " " 6"—7" "	8"
Small Mortisers	6"
Single End Tenoners	6"
Double End Tenoners	7"
Double End, Double Head Tenoners	10"
Planers, Matchers, Moulders, Stickers, Jointers, etc.	
With Knives 6"—10"	5"— 6"
" " 10"—20"	6"— 8"
" " 20"—30"	6"—10"
Shapers Light Work	4"— 5"
Shapers Heavy Work	8"
Spindle Carver	4"— 5"
Belt Sander Belt less than 6" wide	4½"
" " " " " 6"—10" wide	5"
" " " " " 12"—14" wide	6"
Drum Sander 24"	4"
" " 30"	5"
" " 36"	6"
" " 48"	8"
" " over 48"	10"
Disc Sander 24" dia.	5"
" " 26"—36" dia.	6"
" " 36"—48" "	7"
Arm Sander.	4"

Maintaining Highest Efficiency

Because of its simplicity the exhaust system usually receives but little attention once it is installed. However, to obtain the best results it should be inspected at suitable intervals and necessary adjustments made. The exhaust fan should be given proper attention the same as any other high speed machine. It must be kept in proper alignment and tightly bolted to its foundation.

Suction hoods which have been removed to adjust the machine should be replaced as soon as the adjustments are completed.

Never start a machine with the blast grate closed as the slight air leakage past the blast grate may draw the refuse into the pipe and clog it.

Disconnect furnace feeders from the furnace when delivering refuse to the storage bins, or when the fan is shut down.

Keep all large heavy blocks, knots, slivers, etc., out of the system as far as possible.

How Power May Be Saved

Blast grates on connections leading to all idle machines should be closed, up to 25% of the connected areas of the trunk line in question. This effects a corresponding saving in power, however, do not close more than this number of blast grates unless especially allowed for in the design of the system. Also do not overload the system by ill-advised additions.

The casual observer sees a wood refuse exhaust system in operation and gives little thought to the complicated problems involved in its design. And yet, unless a careful study of these problems has been made by an experienced designer, it is almost a foregone conclusion that the system will not work well, or the power used will be excessive. Only by careful designing based on correct theory and practical experience can that balance between the parts, so necessary for a successful and economical system, be obtained.

Woodworking Industry Lacks Practical Literature

Few Good Books Dealing With Practical Phases of Work—Would Help in Developing All Around Men—Many Subjects Could Be Covered

By Wm. Snaith, Associate Engineer,
Forest Products Engineering Co., Chicago

Of the writing of books there is no end. Every division of human thought has a literature of its own. The marvel is that enough readers can be found for some of it to pay the cost of printing. It is still more marvelous to find a large and important field hardlp touched as yet. The manufacturing woodworking industry has hardly any literature although what it has is of excellent quality. It is like an island in the midst of its allied industries which are in some cases oversupplied. There are many valuable works on lumber and forestry. Carpentry and joinery are dealt with in many books of varying degrees of value and of the books on the steel square it can be truthfully said that their name is legion.

When we come to manufacturing---chair, furniture, millwork and the like---there are no books to put into the hands of a beginner, or of the skilled worker. Some few exceptions exist to this statement. There is a scholarly work on kiln-drying of lumber and an excellent little book on moulder practice. Apart from these the field is untouched except for the government bulletins, the magazine literature supplied by the technical journals and the catalogues of the machinery and kiln companies. All these are excellent and indispensable to anyone who wishes to remain up-to-date. Yet there remains the lack of a more complete and permanent literature.

How Such Literature Would Help

The value of such a literature as we have in mind would be considerable in maintaining the interest of the rising generation of woodworkers and in increasing their efficiency. In the modern system a man becomes skilled in running one machine or in performing

one operation. If he can study the other operations and machines his outlook is broadened and he is able to see his own work in its true perspective. If he should be called on to change he will have some knowledge of the new work before he starts. We are not producing many all-around men in these days and a comprehensive literature would give us back many of the things we miss through this lack. In the training of present and future foremen also such a literature would be of the utmost value.

What we should like to see would consist in part of a series of books dealing with each of the machines in a mill, well illustrated to show methods of setting up, points to be observed to secure good work and safety in operation. Short cuts and kinks should be covered and old as well as modern machines described. Not all plants are equipped with the most modern machinery. We should like to see books dealing in a practical way with the manufacture of chairs, case goods, tables and upholstered furniture. It might even be possible to include a book on saw-filing but this may be asking too much, there exists such a diversity of opinion on the subject.

Could Include Technical Works

After these books would come others of a more technical nature covering subjects such as the correct thickness and tooth-spacing of saws for a given duty, the correct cutting and clearing bevels for planer and jointer knives, determining the economical speeds and feeds on all machines. The list could be extended further. The problems of management have only been touched by one book so far. There is still much that can be written along this line. The subject of piece-rates alone could fill a large-sized volume.

The need exists. It is acknowledged from time to time by men in every kind of position in the industry. This is written to put the matter definitely before those most directly concerned in the hope of stirring up comment and action. By way of concrete suggestion let it be proposed that some of the associations in the furniture world get together as they are doing in connection with the Furniture Publicity campaign and create this literature in part at least. They would be helping themselves to a greater extent than may appear at first sight and the effect would be cumulative, growing as time goes on.

Do You Know Conditions in Your Kiln?

One authority on dry kiln work recently remarked that many woodworkers have a pretty fair idea of the conditions which should prevail in their kilns and while they think they are securing the temperature, humidity and circulation they want, they do not take the trouble to make a few tests and make sure. In other words, they are inclined to take too much for granted. As an instance, one kiln owner figured that he should have a certain percentage of relative humidity at the dry end of his progressive kiln and that the vapor from the steaming chamber, which was at the green end, would give this required humidity. Resting secure in that belief, he operated the kiln for months, and while the results were fair, he was troubled quite a bit by casehardening. A few tests, which necessarily had to be taken inside the kiln and under full operating conditions, were sufficient to prove that he was not getting within 20 points of the desired relative humidity. He knew what he wanted, thought he was getting it, but wasn't.

One of the first maxims for successfully operating a dry kiln is to take nothing for granted. The operator should get right in the kiln and make sufficient tests to satisfy himself that the circulation, humidity and temperature in all parts of the kiln are as he wants them. That is the only way he can be sure, and, unless he knows, he is working in the dark. Perhaps a few tests in your kiln will reveal conditions which may give you food for thought. Why not make a few to-day?

Heads Canadian Lumbermen's Association

Alfred E. Clark, Toronto, was elected president of the Canadian Lumbermen's Association at the convention held recently in Toronto. Mr. Clark, who is vice-president and managing-director of Edward Clark & Sons, Limited, Toronto, wholesale hardwood dealers, is well known to the lumbering and wood-using industries having been interested in lumber and lumbering practically all his life. As a boy he assisted in the logging and manufacturing operations which were conducted by his father. Later, when Mr. Clark, Sr., sold his mill and moved to Hamilton to enter the wholesale field, "Alf." as he is familiarly known, took an active interest in the firm which was then known as Edward Clark & Son. In 1907 the business was moved from Hamilton to Toronto.

A. E. Clark, Toronto

The new president has always been intensely interested in the progress and development of the lumbering industry. He was one of the organizers and chairman for two years of the Wholesale Lumber Dealers' Association, Toronto, and has for a number of years been a director of the Canadian Lumbermen's Association. His activities are not confined entirely to Canada as he is a trustee of the National Wholesale Lumber Dealers' Association, New York, and a former director of the National Hardwood Lumber Association, Chicago. He has always given liberally of his time and energy to anything which might tend to further the lumbering industry.

Under Mr. Clark's capable direction the Canadian Lumbermen's Association should enjoy one of its most active and successful years.

What Waste Do You Figure On Box Stock?

Old Allowance of Ten to Fifteen Percent Not Adequate—Correct Method of Application—Ascertaining True Lumber Costs.

By H. L. Pease, Secretary National Association of Box Manufacturers, Chicago

Waste is an item of no small importance in the box factory. Frequent tests should be made in order to ascertain waste in process of manufacture. This can be done by measuring the amount of raw material passing through the planer and comparing that figure with the amount of lumber contained in the finished product, says a writer in Barrel and Box. The old standard 10 per cent or 15 per cent waste factor cannot be used to-day. Labor efficiency, or more properly, inefficiency, is the cause of added waste, so that what once was fair does not to-day cover the waste account. Each factory must obtain for itself at frequent intervals the percentage of waste to charge to the lumber bill.

To quote from the Uniform Cost Finding and Accounting Plan adopted by the National Association of Box Manufacturers:

"The percentage of waste is commonly spoken of as being related to the quantity of raw material out of which it develops. The manufacturer must be careful, however, to distinguish between the percentage so arrived at, and its application to this product in which he recognizes only the net feet from which the waste has already been eliminated.

Correct Application of Waste Percentage

Thus as an illustration, the following example might be cited:

Material delivered to the factory and used.... 1,000 ft.
100 boxes manufactured, contain.....800 ft.

Material wasted..... ....200 ft.

Percentage of waste, 20 per cent.

Percentage of material in product, 80 per cent.

We will now reverse the proceeding by beginning with the known quantity of material in 100 boxes, and show that the addition of that percentage to the finished feet will not correspond with the number of feet used:

100 boxes contain..... ....800 feet
Add waste—20 per cent..... .....160 feet
Total material accounted for in cost..... ..960 feet

This is obviously wrong, but in order to dispel any doubt regarding this point, the above illustration is cited. As a standard method of figuring waste into finished product, the following is recommended:

100 boxes contain..... ....800 feet
This equivalent to 80 per cent of the amount of lumber required.
Therefore, divide 800 feet by .80, and the result is the amount of lumber required, or..... ....1,000 feet

Waste: Waste is a by-product, the sale of which should be accounted for as a separate product. The money derived from such sale should never be used as an offset of lumber values. We are not in business to manufacture waste; otherwise, we would turn our entire product into sawdust and shavings. It is a separate product and should be so treated.

In computing the cost of raw material into the mill the replacement value should always be considered. In order that there may be no misunderstanding as to the replacement value, we wish to call your attention to the fact that this value is not the average market price f. o. b. cars shipping point, but is the market price f. o. b. cars delivery point. The average delivered price on round edge box lumber is the going market replacement value.

Yard costs of:

: A proper charge to lumber of yard rental, or, in case of yard ownership by the mill, a proper rental or interest charge should be made on land investment.

Second: Insurance cost on lumber in yard.

Third: Taxes on lumber in yard and yard valuation.

Fourth: Interest on money invested in lumber, not only that which is being carried in the yard, but that which is being held at outside points for shipment. This is one of the most important items to consider, for today such interest money will cost in the neighborhood of 8 per cent per annum.

Fifth: All yard labor, such as handling costs and teaming from yard to mill.

This is the basis of box factory cost accounting. Without this first step in "putting our house in order" we cannot hope to arrive at any figure that will in any way be representative of the costs through the factory.

These first costs are easily determined.

Know your lumber costs up to the planer. This is the first step in Box Factory Cost Accounting.

Are Our Values Too Low?

At a quarterly meeting of the North Carolina Pine Box & Shook Manufacturers' Association held recently at Baltimore, the subject of box costs came up for discussion. One of the members tabled his cost figures and in the discussion which followed it was brought out that after adding a reasonable allowance for profit, these figures were well above the prevailing market levels. According to statistics presented by another box manufacturer, his net cost, without allowing for any profit, was several dollars above the general level of prices.

One wonders if these are exceptional cases or if box prices on the average are near or below production costs, based, of course, on replacement values. Take in Canada. It is not probable that all box manufacturers have accurate cost systems in operation in their plants; in fact it is doubtful if outside of a few of the more progressive members of the industry, more than the merest outline of what constitutes accurate costs is known to Canadian box men, let alone having some efficient cost system by which they can tell exactly how much their product costs installed in their plants.

Upholstering and Trimming

Modern Upholstering

Preparing Back of Chair for Down Filled Cushion —How Patterns are Made and Coverings Cut

[Continued from December issue]

The back is then lightly double-stuffed with the edges shaped up and stitched, as shown in Fig. 69. Following this, a layer of hair is placed over all the back and woven into a compact mass, as shown in Fig. 70. The back at this stage may be covered with muslin if desired, but inasmuch as the down-filled cushion is sewn to the stitched edge, the under muslin may be dispensed with allowing the cushion itself to provide covering for the hair. It is important that the shape of the stitched edge should be kept to a uniform curve, rounding off at the top of the chair and finishing just even with the curve of the side post at A. Fig. 70.

This shape should be the same on both sides of the chair, and when the upholstering has reached the stage already described, a pattern of the outline of the back, from B to A, and of the stitched edge from A to C of the same figure, is drawn on a piece of cardboard, see Fig. 71. The line A to C will be the under part of the down cushion and the side border of the cushion must follow this line without any deviation. Therefore, with the outline A—C drawn on the cardboard as a pattern, proceed to lay out the dimensions of the border of the cushion, as indicated in Fig.72.

In the case we are illustrating, the border of the cushion at its deepest part is two inches, and this dimension is marked off on the cardboard, Fig. 72, and the edge of the cushion is sketched diminishing toward the top finishing at A in a graceful curve, as shown in Fig.73.

The various sections of the cushion are filled, as already indicated in a previous instalment, and the completed cushion is sewn to the stitched edges, as shown in Fig. 74.

Too much stress cannot be laid upon the importance of shaping the cushion in this way, because by no other plan is it possible to obtain a proper allowance on the borders of the down casing and at the same time avoid objectionable wrinkles when the filled cushion is attached to the stitched foundation.

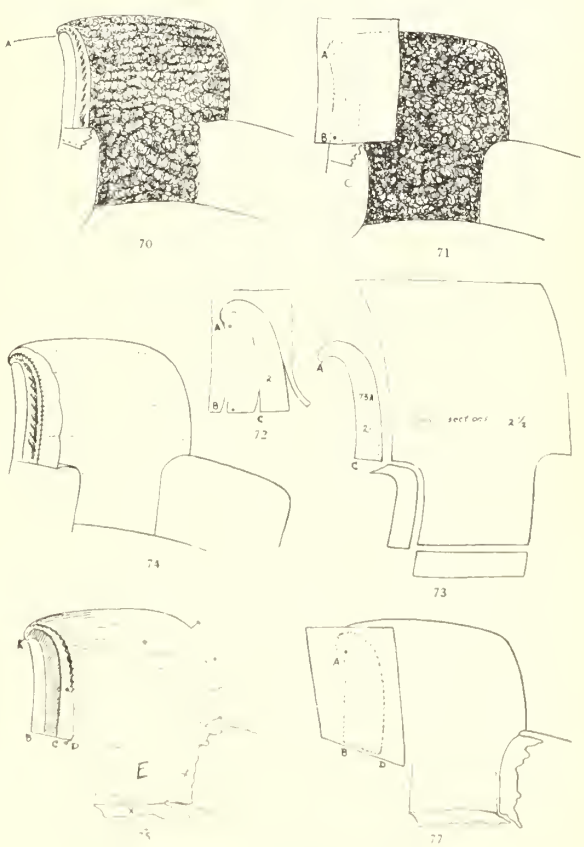
Having reached the stage shown in Fig. 74, measurements are taken of the back, and the covering planned accordingly. The main covering indicated by the letter E in Fig. 75 is cut to shape and pinned into place with tacking strips of muslin sewn at the points where the covering must reach through to the back for attaching (see Fig. 75) and the fullness of the rounding edge from B. A is taken up by overcasting the material with a stout stitching twine in such a way as to shirr the fullness on the stitches.

The tighter the twine is pulled the more closely the fabric will be shirred and in this way the surplus fullness will be dispossed of without the necessity of pleats. The fabric edge from D to A is pinned to the cushion temporarily while the shirring is being done to give it the proper shape.

Another cardboard pattern of the back is now made, following the plan explained in connection with Fig. 71, and this pattern must have the true shape of the back as now outlined by the lines A B, and D in Fig. 75, with tacking allowance added between A and B and stitching allowance between D and B. See also diagrams Figs. 77 and 78.

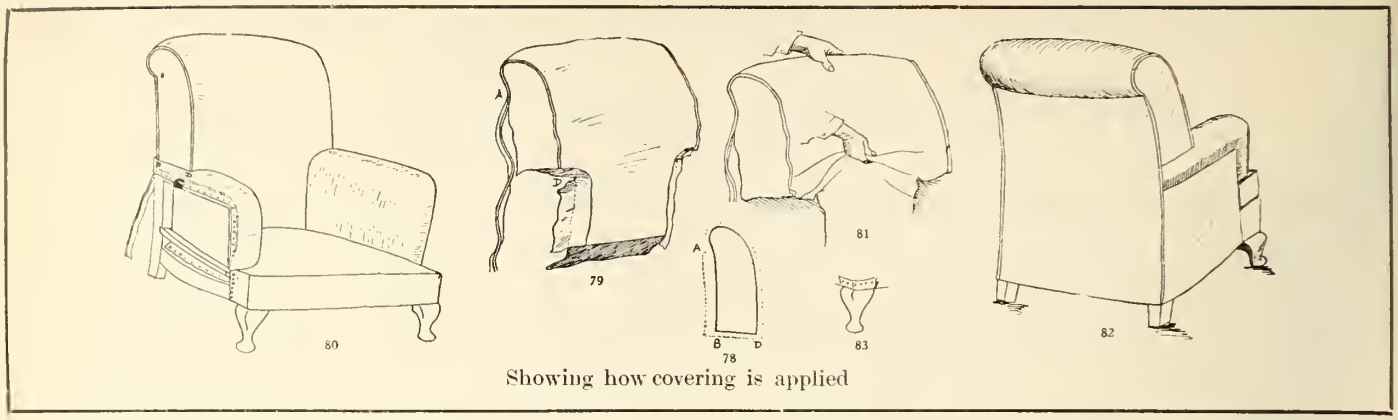
The covering, E, is now removed, and the other parts indicated in Fig. 78 are attached with such tacking strips as are necessary to draw between the seat and back and when the arms and back, and the covering assembled as a loose cushion cover shaped like Fig. 79.

It will be noticed that the welt which is attached permanently from point D around to point A is made long enough to reach to the bottom of the chair. This extra length is provided so that the back of the chair may also be finished with welt as indicated in our Fig. 57 and also in Fig. 80.



Development of down-filled Back

The covering Fig. 81, is slipped on over the top of the back and pulled down into place. After all the edges have been tacked, it is backsewn from D to B, Fig. 80. The outside arms are put on and the welt on the back edges carried down to the base of the chair and finally the outside back is back-tacked to the top rail, even with point A of the various figures, and then sewn to the welt all around, making a finished



Showing how covering is applied

pearance of outside back in Fig. 82.

To avoid showing tacks above the shoulders of the front legs, a piece of material is backtacked above each leg, as shown in Fig. 83, and to this the bands are blind-sown, the balance of the bands and linings being tacked beneath the rails.

The seat cushion of this chair is made, in all respects, the same as the cushion shown in the chair previously treated, with the addition that the front corners are shaped to fill out the spaces where the arms do not extend to the front edge of the seat.

We have already indicated in connection with the chair described in previous instalments the method of taking the pattern and the filling of the cushion, and space need not here be taken to repeat the same instructions.

(To be continued)

The Demand for Chesterfields

Once in awhile one hears the opinion expressed that the popularity of chesterfields and, in fact, stuff-over furniture in general, is on the wane. No doubt this suggestion is the result of some temporary lull or quiet spell, for the manufacture and sale of this type of upholstered furniture goes on at a fairly even rate. The appearance, serviceability and comfort-giving qualities of high-grade chesterfields are such that it is likely that they always will be in strong demand.

You will notice that the term "high-grade" is used in the last sentence of the preceding paragraph. The manufacturers of upholstered furniture should make strenuous efforts to maintain the quality of their product. Placing a cheap line on the market is only a temporary expedient, giving only temporary gains; it is not conducive to steady businesss, and, in addition, through time the demand for and reputation of the better grades is sure to be affected.

Furniture dealers are continually clamoring for cheaper chesterfield suites. They do not appreciate the true worth of the better-grade product but look at the price only and holler for something at less money. Some upholsterers have set out to cater to this demand and are producing a line that is cheap in every way; cheap material, cheap filling, cheap construction and low in price, but dear at any price. A dealer sells a suite of this kind to a customer and after it has been in use a short while, the backs and arms are loose and baggy, the seats have gone soft and flat and the pieces look worn out. They have, in fact, outlived their period of serivce. What is the result? The customer is dissatisfied and condemns chesterfields in general. Perhaps a complaint is laid with the dealer who in turn feels injured and makes a kick to the manufacturer. In the long run nobody is satisfied. Not a very attractive or desirable business.

Now, who is to blame? The manufacturer blames the dealer for demanding a cheap product while the dealer blames the manufacturer for producing a worthless suite. In reality, both are to blame. The dealer should be sufficiently interested in the lines handled to know something of their construction and value. He should have sufficient pride in his business and be sufficiently well informed to want to sell only serviceable articles and be able to point out why one is good value while another at, perhaps, a lower price, is not worth having. Actually the manufacturer who, regardless of his reasons, produces an inferior article, should shoulder the full blame and take full responsibility. Instead of yielding to the dealers' cry for cheaper chesterfields, he should take the trouble to show that the cheaper article is dear at any price and why. More than that he should refuse to have anything to do with the production of a cheap line. As a rule there is little, if any, money in it, very little satisfaction, no goodwill and no reputation to be made, at least not a desirable one.

The manufacturer of cheap chesterfields cannot pass the buck. He and he alone is the responsible party. If he has any regard for his own reputation and for the permanency of his business, this question is worth some deep consideration. There may be different qualities and different grades at various prices but there is only one kind of a line to produce, and that one that will give service and satisfaction.

Industrial Significance of Standardization

1—Stabilizes production and employment, since it makes it safe for the manufacturer to accumulate stock during periods of slack orders, which he cannot safely do with an unstandardized product.

2—Reduces selling cost. This is generally overlooked. Possibilities of reduced costs are generally even greater in distribution than in production.

3—It enables buyer and seller to speak the same language, and makes it possible to compel competitive sellers to do likewise.

4—In thus putting tenders on an easily comparable basis, it promotes fairness in competition, both in domestic and in foreign trade.

5—It lowers unit costs to the public by making mass production possible, as has been so strikingly shown in the unification of incandescent lamps and automobiles.

6—By simplifying the carrying of stocks, it makes deliveries quicker and prices lower.

7—It decreases litigation and other factors tending

to disorganize industry, the burden of which ultimately falls upon the public.

8—It eliminates indecision both in production and utilization,—a prolific cause of inefficieny and waste.

9—By concentrating on fewer lines, it enables more thought and more energy to be put into designs, so that they will be more efficient and economical.

10—By bringing out the need of new facts in order to determine what is best and to secure agreement on most questions, it acts as a powerful stimulus to research and development,—and it is thus in decided contract to crystalization resulting from fixity of mental attitude.

11—It is one of the principle means of getting the results of research and development into actual use in the industries.

12—It helps to eliminate practices which are merely the result of accident or tradition, and which impede development.

13—By concentration on essentials, and the consequent suppression of confusing elements intended merely for sales effect, it helps to base competition squarely upon efficiency in production and distribution and upon intrinsic merit of product.

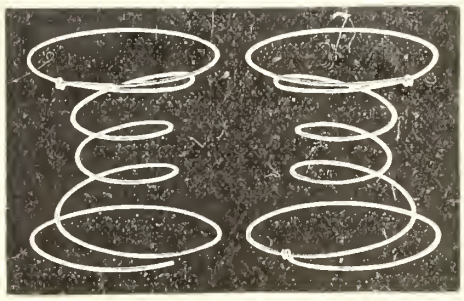
14—Standardization is increasingly important for the maintenance and development of foreign trade. There is strategy in nationally recognized" American" specifications.

15—The efficiency of competing countries, increasing through national standardization programs, is liable to transfer competition from foreign markets to our own shores.

16—Joint efforts in bringing about standardization within and between industries almost invariably leads to better understanding and to benefical co-operation along other lines,— a step toward the integration of our industries.

The B. F. Sturtevant Co., Galt, Ont., and Boston, Mass., had an interesting display at the annual convention of the Canadian Lumbermen's Association held in Toronto recently. They were showing a small, but complete, model of their forced circulation, high humidity lumber dry kiln. The kiln proper was constructed of plate glass so that the way in which the air is forced through the lumber piles was clearly shown. Considerable interest was evinced in this display. Kenneth Redman, Boston, manager of the dry kiln department, was in charge.

"IDEAL"
FURNITURE and UPHOLSTERY
SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,
of Canada, Limited
Windsor - Ontario

E. T. CARTER & CO.
84 FRONT STREET EAST
TORONTO

Dealers in

Fibro Products, Linters,
Reeds, Rattans, Waste.

Quality Guaranteed. Prompt Shipment

Eagle-Ottawa Leather Co.
TANNERS OF
FURNITURE LEATHER
OF EVERY DESCRIPTION
We are making a specialty of cutting
Spanish Split Leather for Chair Manufacturers
Quotations and samples furnished on application
We will be pleased to supply a very attractive sample book, of all our grades on application.
GRAND HAVEN - - - - - MICHIGAN

DOON TWINES, LTD.

Manufacturers of

Flax, Hemp and Jute Twines and Cordage

"QUALITY AND SERVICE"

Furniture Twines
Stitching Twines
Seaming Twines

DOON TWINES D MADE IN CANADA

Warehouse Twines
Spring Twines
Hemp and Jute Twines

Write for Samples and Prices

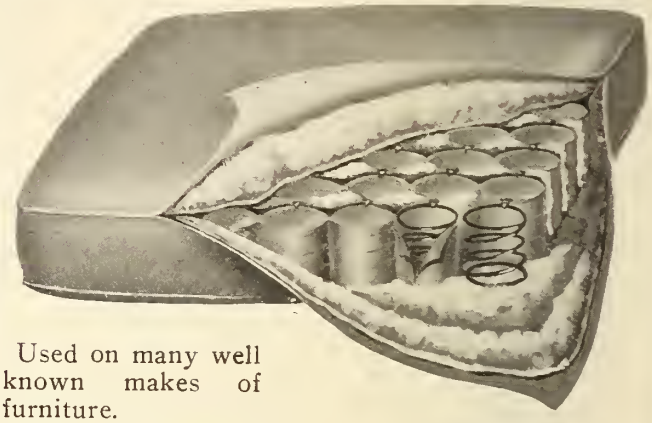
Mills at Doon and Kitchener

Head Office, KITCHENER

"COMFY" CUSHION COMPANY
Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.



Used on many well known makes of furniture.

Write for Catalogue

"Comfy" Cushion Co.

340 Gerrard Street, East, TORONTO, Can.

D&P

QUALITY

QUALITY

CURLED HAIR GLUE SANDPAPER

DELANY & PETTIT LIMITED

TORONTO.

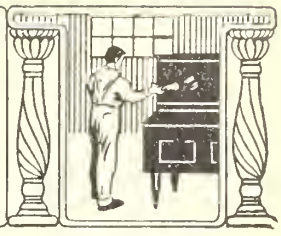
OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC

QUALITY

QUALITY

THE FINISHING ROOM



Effects of Chemicals on Wood

Acids and Chemicals Play Large Part in Modern Finishing—How Different Acids Act on Wood — Suggestions for Different Shades

By R. J. Winton

Many of our most attractive finishes owe much of their depth of tone and richness of color to some one of the many acids and chemicals employed by the present-day finisher. Such acid may have been applied direct or may have been used in the stain, according to the kind of acid and the finish and tone desired. Acids are employed chiefly on hardwoods and more particularly on oak, mahogany and other woods which contain tannic acid. They do not seem to have much effect on dry pitchy or sap wood, and have little or no effect on such woods as pine, spruce, basswood, whitewood, etc.

The effect of acid or chemical stains is permanent for they change the actual chemical nature of the wood itself. In addition, they produce clear, bright tones, without any signs of the muddy, cloudy effects so often noticed when pigment stains are used. The results secured are permanent and do not exhibit any tendency to become lighter or fade out, even when exposed to the strongest light. In the furniture and piano industries, such stains are used to produce weather and fumed oak and other finishes of a similar nature. These shades are usually secured by darkening the wood though certain chemicals actually change the color of the wood.

In General Use

The commonest of all acid or chemical stains is ammonia. This is used principally on oak or mahogany. It is reduced with water to the desired shade and applied with a sponge, cloth or fibre brush (it will destroy a hair brush). In this, as with all acid stains, it is better to dilute it more than is absolutely necessary and apply successive coats, instead of attempting to use it full strength. Ammonia does not leave any residue when it evaporates so does not affect subsequent coats of varnish or shellac.

Ammonia is also used in producing fumed oak by the fuming process. Fuming produces a fairly even shade, and unless a lot of steam was used does not tend to raise the grain. The depth of tone required governs the length of time the articles should remain in the fuming box. Usually twelve hours is necessary.

Effects of Different Chemicals

What is probably the oldest of chemical stains is ordinary lime water. This is secured by slaking common burnt lime. It has been employed for many years by hardwood finishers for securing a deep, rich tone on mahogany. It is brushed over the surface and allowed to remain until thoroughly dry, when the lime will brush off. After the lime has been removed, the wood is washed thoroughly. A coat of vinegar is given to neutralize any alkali which might remain and which would injure the varnish coats.

Dark stains may be produced with caustic soda or caustic potash. These chemicals are difficult to handle and great care must be exercised in their use. If not applied properly, they are liable to affect the succeeding coats of varnish and shellac.

Chromate and bichromate of potash, also permanganate of potash are sometimes used to secure the once popular golden oak. If used on mahogany, the result is an attractive antique effect.

Picric acid when applied to walnut, gives a slightly yellow effect. This is often used to liven up the tone of the wood. If expense is no drawback, a warm brown tone may be secured with iodine, but this can hardly be classed as a finishing material.

Neutralizing Alkali Before Varnishing

Half a pound of green copperas, dissolved in a gallon of warm water is sometimes used to deepen and fix the results of chemical stains. When an alkali stain has been used, vinegar will neutralize the alkali and save the varnish coats.

Verdigris dissolved in soft water or vinegar, will produce a green shade on almost any wood.

A solution of sulphuric acid and water, equal parts of each, will give what might be called a sixteenth century effect on oak.

Walnut may be made to resemble rosewood by giving the wood an application of bichromate of potash dissolved in water.

For a metallic black apply a strong solution of nitrate of silver and afterward expose the work to strong sunlight. This is applicable to any wood.

Practically all chemicals and acids used in the finishing room are active poisons and should be handled accordingly. The hands should be washed thoroughly after working with such stains. Some workmen make a practice of using rubber gloves. The idea is a good one and should be followed wherever possible.

Testing Pumice for Impurities

Pumice stone is of volcanic origin and is found in the craters of extinct volcanoes. It is in reality the solidified spume or foam formed by escaping steam on the surface of molten lava that has been thrown out by a submerged volcano. Italy is the chief source of supply. Many of the mines are worked by convict labor. After being mined, it is ground and sifted through wire screen and through the meshes of special silk. It is in this way that the different grades are secured. It is an easy substance to adulterate and thus is often mixed with other materials such as silicate. The test is to take a little in the palm of the hand and, after wetting it, rub it with a finger. If any soft dust that does not cut is felt, like chalk or whiting, one may be sure that it has been adulterated.

Do You Spray From Front or Back of Top?

Operator Should Study Work for Best Results—Cleanliness is One of First Essentials—Keep Spray Close to Work

By C. H. C.

The spraying machine is like every other machine in that it will do the work for which it is intended if manipulated right but it will not do work for which it is not intended. The finishing room foreman who knows his job knows when the spraying machine can be used to best advantage and when it is better to have the work done by hand.

Where it is right and proper to use the spraying machine for varnishing it is a great saver of time and of labor. These two items mean much in modern finishing rooms. Time schedules are part of the production forces that make profits and finishing room foremen know that they must be adhered to. Labor saving is a great and proved economic gain to every one concerned. Where time and labor can be saved by the use of a spraying machine every effort that will increase the effectiveness of the operation must be brought into action.

Judgment in Selecting Spray Jobs

Of course, there is work that cannot be done by the spraying machine and it is folly to try to make any machine do things which it should not be called upon to do. There is a distinct loss every time such procedure is forced in any finishing room.

The first thing that a good finishing room foreman sees to is to ascertain if the spray gun is clean. He constantly cautions the operator about this and never leaves the matter to chance but demands "to be shown" every time. This close inspection should be put upon every part of the gun and hose. Inspection should be made to prove that the gun and hose are not leaking air or varnish.

In using the spraying machine some finishing room foremen insist upon having both the air and varnish heated. Others only heat the air. The best way is to try and find out which is best under given conditions and then do what is necessary for best results.

Not Too Far From Work

In several finishing rooms, careful watch has shown that many operators of spraying machines stand too far away from their work. It appears to be best to stand as near the article being sprayed as is possible. Of course, the spray will be thrown some distance but that is what really causes the trouble. The temperature some distance away from the end of the gun may be many degrees different than the temperature close to it and that difference may be the measure between a good job and a poor one. The varnish that is carried the farthest in a spray from the gun will naturally be exposed to more cooling than that thrown from the gun at the shortest possible distance.

Spray from Nearest Edge

In one finishing room close attention to these facts disclosed many disadvantages which admitted of solution and betterment. The operator was using the spraying machine to varnish large table tops. He began his work on one side of the table top farthest from him and worked towards himself. Each time he threw the spray across the table top the air was blown across the part that had been varnished and that caused the varnish to set and prevented proper flowing. A change was made and the spraying was begun on the side of the table nearest to the operator and the air was then blown on to the bare top and did not reach the parts already varnished and a far better job, of course, was the result. It is generally conceded by all that varnish should never in any case be applied in a draft and yet, when using a spraying machine to save time and labor, the operator was making a draft himself before he changed.

Spraying varnish can be made an asset in those finishing rooms where the foremen and the operators study conditions and use their best judgment in the operation of the machines. The machines cannot work by themselves and they do so much as to deserve the best attention and skill of the operators and those in charge of the work.—"Finishing Facts"

Selecting and Training Salesmen

(Continued from page 71)

est asset. You cannot see personality, you just sense it. It is a thing you cannot define, and the greatest element of personality is health. His eyes are bright and his step springy, and he thinks just a little faster than his prospect; he cannot do it unless he has 100 per cent. health.

One of the reasons salesmen fall down is because they are not supervised closely enough. I do not mean bossed. We do not know the meaning of "Boss" in our organization.

Supervision means for one thing that you get out with the salesmen occasionally, especially the men in the Provincial territory, who are meeting to-day probably the greatest resistance in the history of trade in this country. They are only human, they get lonesome, they have gone a week perhaps without an order. The greatest asset for a salesman to have is a big stout heart, not knowing the meaning of "Quit." Well, that man needs supervision it might be termed, or Assistance, a new injection of Enthusiasm, which he can only get from an executive higher up.

As to training. How many firms do not seem to realize its necessity? I have had men come to me who seem to have been given a price list and an order book and left to grab any further knowledge they could out of the atmosphere. Those salesmen are going to run against other men in parallel lines who have been trained, and we have got to see to it that our men are epuipped to meet these trained men. If in your own judgment the new salesman is the right material for your organization, then it is worth spending time and money to give him the proper ammunition.

The furniture factory being erected at Milverton by the B. & N. Planing Mill, is nearing completion. Construction work was undertaken over a year ago and then when the demand for furniture eased off work on the building was stopped. Recently a decision was reached to complete the furniture factory and put it in operation. This plant is to be operated under the name of the Milverton Furniture Company, Limited.

Frank E. Mutton, Toronto

Selecting and Training Salesmen

Constructive Sales Efforts Required for 1922—Where to Look for Good Salesmen—Thorough Training and Knowledge of Line Essential

By Frank E. Mutton, International Business Machines Co., Limited, Toronto

Well made may be half sold; but at the present time the sales problems are seemingly of major importance. Today the manufacturers of furniture and other wood products are having as much difficulty in disposing of their output as they had a short while ago in taking care of the volume of business which was offering. During 1922 the sales problems will probably take first place. In view of this, the following extracts taken from an address on" Selecting and Training Salesmen." delivered by Frank E. Mutton, of the International Business Machines Co., Limited, Toronto, should prove of interest and value to the readers of the "Canadian Woodworker."—The Editor.

Of course I recognize that a sales organization selling a specialty like Time Recorders or Scales is different from one selling a standard article, however, I believe the same fundamental principles apply, and that this matter of selecting and training salesmen is the most important factor facing executives of any concern to-day. It is the salesmen that keep the factory chimney smoking, and the amount of smoke depends on the efficiency of the sales-organization, absolutely.

The quicker we all realize that prosperity depends on the action of our self-starter the better. A good many people are just waiting for something to turn up, even sales managers. To my mind there is nothing "going to happen" until you make it. Instead of the men going out on the 9 o'clock train they will have to go on the 7 o'clock if they are to succeed, and instead of coming in Thursday night or Friday noon, they will come in Saturday morning,—if they are lucky. These are the new conditions that we are facing.

I want to convey this idea; it is not necessary to tell most men these things, it is necessary to "sell" them. In our organization we never tell a salesman to do something. We "sell" the proposition. That is the only way to get the proper co-operation and spirit.. The art of selling is the art of buying. What do I mean?—well, the amount you sell depends on the amount of confidence you can buy, the respect you can buy from the prospective customer. I think that is an important principle to have the sales force memorize.

Now where are we going to get our salesmen? Our experience is that we get our best men through our present sales force. Those men know the policy of the company, they have confidence in the company, they know the calibre of men the company want, and they have seen in action the men that they are going to send in to apply for the position. That is something you cannot do as a general proposition. They know whether he plays pool in the hotel until 2 a. m. or poker until daylight. They know his characteristics through working with him. I emphasize that, because looking back over my experience during the last thirty years I find that the best salesmen it has been my good fortune to secure came through the salesmen we already had.

Another channel is the retail store. We have secured some excellent men who were retail store clerks.

I do not believe it is good business or sound policy to hire a man who is out of a job. That, perhaps, sounds severe, but there is generally some reason why he is out of a job, and it is difficult to get at the true reason. If you are going to put up a "Safety First" sign get a salesman who is in a position.

Now, I want to put before you in thls graphic way, these principles:

Get them clean—Mentally, Physically, Morally, Spiritually.

That to me is "The Bible" in hiring Salesmen. There is no one of those things that you can afford to overlook. And you can test them all out in your interviewing.

Mentally.—The salesman who will consume time telling those stories that we sometimes hear is not clean mentally. The results show physically and morally.

Spiritually.—This is very important. Sometimes we meet a man who does not believe in such things as churches. I am not preaching a sermon, but I know the value of that element, we all do.

Then I would like to add keep them clean as to the environment they live in.

I have a chart on my desk and that is always ticked off 100 per cent. before a man is taken into our organization. Health is most important. If a man has not got 100 per cent. health he is anchored. A lot of talks have been made on Salesmanship; to me Salesmanship is the combination of a lot of qualities. Health is the foundation.

Our company spends a good many dollars a year in taking care of the health of the organization. We talk to them of what to wear, what to eat,&c., &c. A lot is wasted, but some gets home and it does a lot of good. I venture to say when you meet one of our salesmen you find he is "in the pink." If he is not, he will not go out, they are trained not to.

When a salesman approaches a prospect, one of the most important elements in getting that man's order is the salesman's health. Selling is largely a matter of domination. You need all the health and energy at your command to dominate some people; if you are feeling about 70 or 80 per cent. fit, the buyer will do the dominating. Health is the foundation of everything. Take personality, the salesman's great-

(Continued on page 70)

Nichols Varnish Drying Equipment

A complete unit of fan, motor, heaters, air compressor, with automatic temperature and humidity controls for the correct drying of all coatings on the finest pianos, talking machine cabinets, furniture, automobiles, etc. A new humidifying air washer, which eliminates all dust and dirt, does away with all spray heads and connecting piping.

Will triple the output of your finishing rooms; decrease the congestion in your factory; reduce investment of goods in process and improve working conditions for your employees.

Better finish, scientifically dried from the inside out.

We will analyze conditions in your plant and submit a proposition covering an equipment suitable for your requirements, whether it be for automobiles, talking machines, pianos, furniture or railroad cars.

We have exclusive authority to issue license to use the Grosvenor Process Patent in all territory East of the Mississippi, Ohio and Detroit Rivers in the United States and Canada, the only varnish drying process that simultaneously subjects the coatings to the action of moisture in excess of natural humidity.

We also manufacture the Nichols Lumber Dryers, Veneer Dryers and Hydraulic Pumps. It will pay you to address us for further particulars.

A. S. NICHOLS COMPANY Aeolian Hall **New York City**

Increasing the Speed and Decreasing the Cost of Your Finishing Room Operation

How practical, how advantageous and how dependable DeVilbiss Spray-painting equipment is, has been demonstrated in finishing rooms of every size and line.
Not merely in dozens of finishing rooms, but in thousands of them. Not only where a few different kinds of articles are handled, but where every kind, size and grade of wood or metal product is finished. Not alone where varnishes, enamels or lacquers are used, but where every kind of liquid finishing material is applied. The

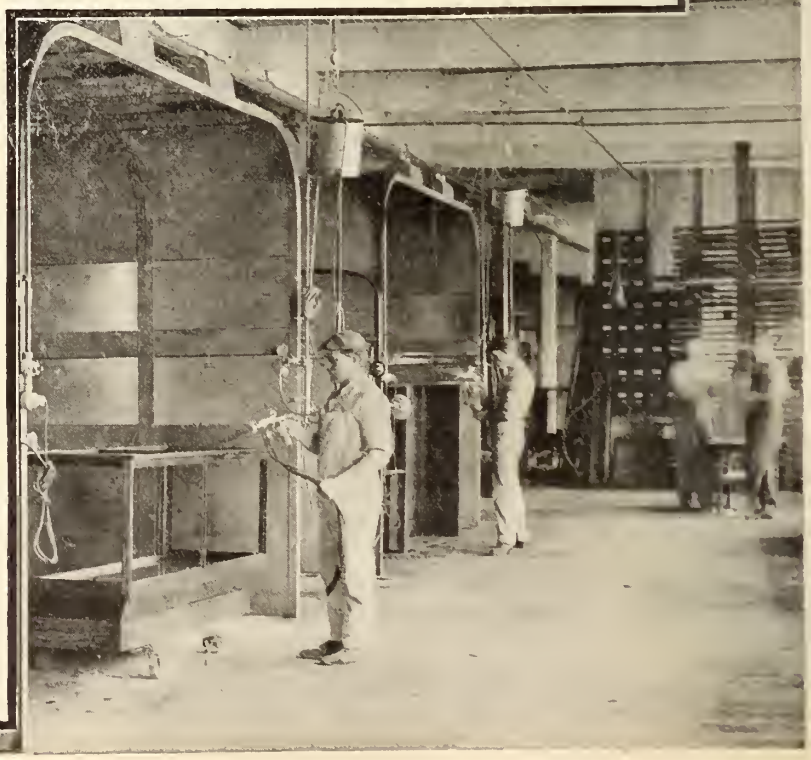
DeVilbiss
Spray-painting System

offers a complete, adaptable and guaranteed service. The finishing operation is speeded up 4 or 5 times over hand-brushing. A perfect, uniform coating is applied on all jobs. Working conditions are made more healthful and safer. Operating and upkeep costs are reduced to the minimum.

With your consent, we'll gladly tell you whether and how the DeVilbiss System can be of service and profit to you.

The DeVilbiss Mfg. Co.
3718 Detroit Ave. *Toledo, O., U.S.A.*

Paint your factory walls faster and better with the DeVilbiss Spray-painting portable equipment. Let us explain.



Linseed Oil has its best equivalent in "FLAXICON." Either in boiled or raw, is elastic, durable and waterproof. Working to the best advantage with colors ground in oil.

Penfound Varnish Co.
CARIBOO AVE. - TORONTO

"ENAMELS"

Our business in both White and Old Ivory Enamels and Primers has trebled during the past year.

WHY?

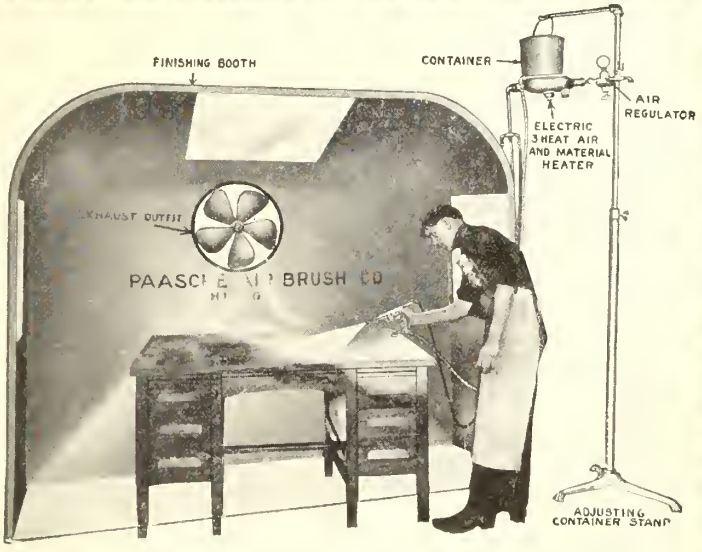
They are the best on the market. If you are not using them, write for samples and prices.

The
Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

PAASCHE

Paasche
Makes
Finishes
Stay

PNEUMATIC RUBBING MACHINES
are rapidly replacing HAND Rubbing and Polishing. RUBS AS EFFICIENTLY AT 4 P.M. AS AT 8 A.M. Girls Can Operate Them.



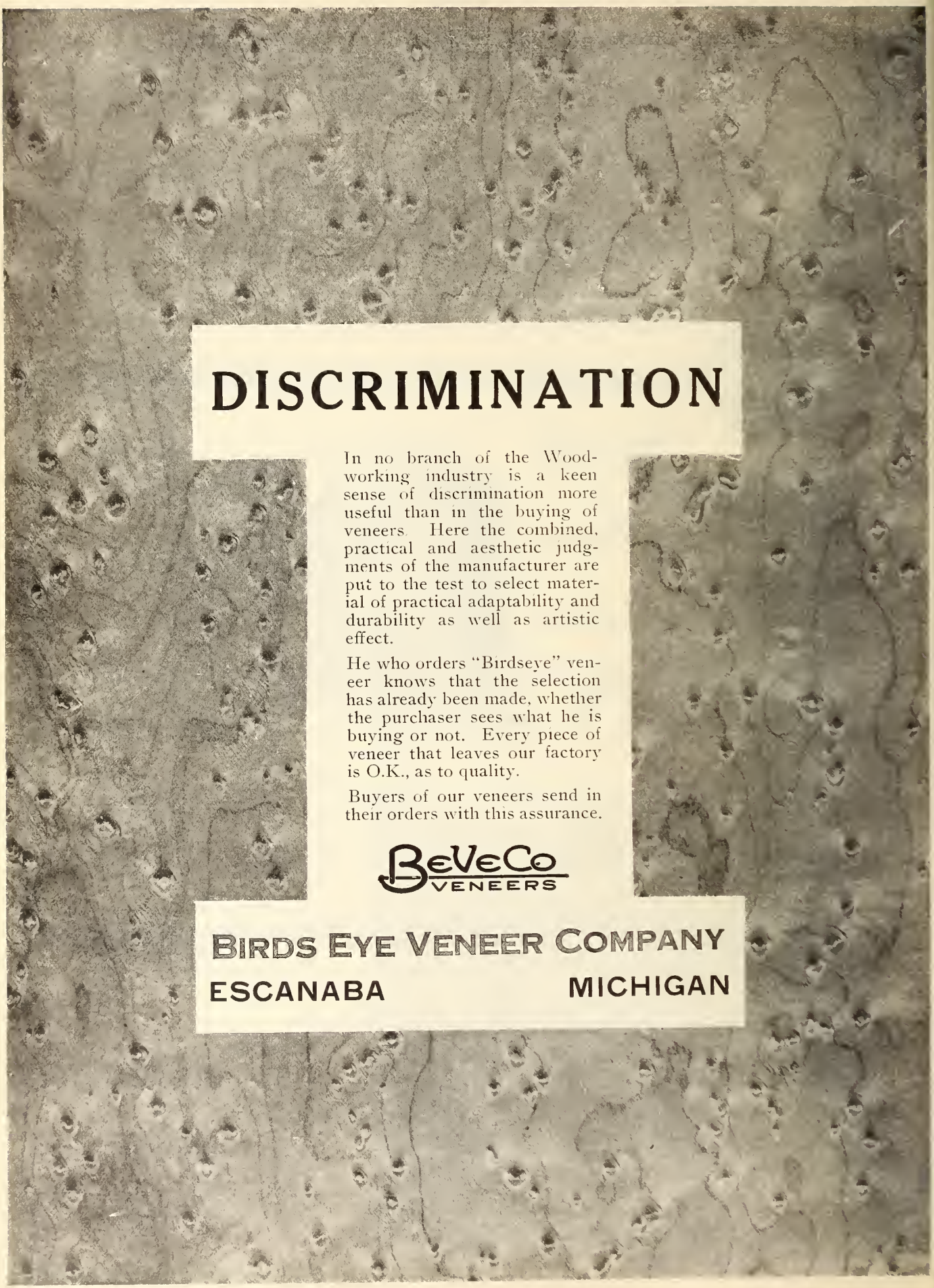
On all surfaces that are to receive hard wear a finish put on with a Paasche Air Brush will give many times longer service because the Paasche method gets better penetration of the paint or varnish; because the air brush puts the finish on smoother with no runs, sags, or fatty edges, and no thin spots to wear through. As a protective measure, a Paasche finish can not be equaled with the old fashioned hair brushes.

Write us for full particulars and for our suggestions

Paasche Air Brush Co.
W. Washington Blvd., Chicago, Ill.

Here's a Suggestion

Do you ever try keeping a file of your back copies of the "Canadian Woodworker"? Try it. Start with this issue. There are many articles that are worth keeping, as they offer valuable suggestions that will help you in your business.


DISCRIMINATION
In no branch of the Woodworking industry is a keen sense of discrimination more useful than in the buying of veneers. Here the combined, practical and aesthetic judgments of the manufacturer are put to the test to select material of practical adaptability and durability as well as artistic effect.
He who orders "Birdseye" veneer knows that the selection has already been made, whether the purchaser sees what he is buying or not. Every piece of veneer that leaves our factory is O.K., as to quality.
Buyers of our veneers send in their orders with this assurance.
BeVeCo
VENEERS
BIRDS EYE VENEER COMPANY
ESCANABA
MICHIGAN

Veneers and Panels

"He Profits Most Who Serves Best"

J. T. Horne Suggests Rotarians' Motto for Veneer and Panel Industry—Report of Annual Meeting National Veneer and Panel Manufacturers' Association—Believe Industry Is Facing Better Business

Business of considerable importance was transacted at the annual gathering of the National Veneer and Panel Manufacturers' Association, held recently in Chicago. Probably the outstanding feature was the proposal to effect a merger with the Plywood Manufacturers' Association. It is probable that definite action will be taken when the plywood manufacturers meet next March. In the meantime a special committee will get in touch with the Plywood Association and see what can be accomplished.

H. Brooke Sale, Fort Wayne, Ind.

Another important piece of business was in connection with the $50,000 advertising campaign, planned to acquaint the public with the merit and value of veneered products. It will be remembered that this campaign was undertaken jointly by the two associations, each agreeing to bear half the expense. To date the Plywood Manufacturers' Association has raised $15,000, while nothing has been done by the National body. H. Brooke Sale, the newly-elected president, declined to accept office unless the members of the National Association were prepared to live up to their obligations. Mr. Sale did not feel that it would be just to himself to accept the leadership of an organization which was not living up to its obligations. Upon the motion of Thomas D. Perry, of the Grand Rapids Veneer Works, the negotiating committee, mentioned above, was authorized to collect the funds for this campaign.

Advertising Campaign Receives Attention

The advertising campaign was discussed in detail. G. O. Worland, of the Evansville Veneer Company, reported that all the preliminary work had been completed and that everything was in readiness for the main effort. He outlined the necessity for immediate action so that the value of the publicity given by the trade press should not be lost.

Wm. Clendenin, of the Conover-Mooney Company, Chicago, who are handling the advertising, gave an outline of what had been done and what it was proposed to accomplish. He urged that the display advertising through the trade, magazine and daily press, should be undertaken without delay. He was followed by Mr. Mooney, of the same organization, in a strong appeal for immediate action.

The freight committee made a report on its action for lower, more equitable rates on veneers. The case is to be continued in Chicago shortly, before Examiner Cassidy of the Interstate Commerce Commission, when a favorable verdict is expected. There does not seem to be any logical reason why the railroads should charge a premium to haul fancy veneers and plywood when the rates on all other commodities are based on weight instead of value.

The officers elected for the ensuing year are as follows:—H. Brooke Sale, Hoffman Brothers Co., Fort Wayne, Ind., president; C. B. Allen, Allen-Eaton Panel Company, Memphis, Tenn., first vice-president; E. I. Ross, Medford Veneer Company, Medford, Wis., second vice-president; Earl Morrison, Jamestown Panel Co., Inc., Jamestown, N. Y., third vice-president; E. H. Defebaugh, Chicago, treasurer; Howard S. Young, Indianapolis, Ind., secretary.

President's Opening Address

The retiring president, J. T. Horne, in his annual address, outlined the situation which the veneer and panel industry is facing and expressed the opinion that 1922 gave promise of better things. His address follows:—

At our annual meeting one year ago to-day we were all very much depressed as to the business situation and, in fact, there was very little to encourage us. At our semi-annual meeting in July conditions were even worse. Orders which we had on our books were cancelled, and to get new business was almost out of the question. It is true that some of our members and other mills who were not members of the association made prices that were below cost in many instances and did manage to keep their plants in partial operation at least, but the majority of the veneer and panel plants of the country were either closed down entirely or running with a very small force, and I am sure that we are all glad that the

year 1921, so far as business conditions are concerned, has passed into history.

While it is a pleasure to do business when we know that after we have taken an order it will be accepted when shipped, it is not a very comfortable feeling when we are always wondering whether or not the order will be cancelled by the time we are able to produce it. It has been impossible to know from week to week just what move to make, and as a whole the year has been a very unsatisfactory one.

But I am glad to be able to say to-day to you that in my opinion—and I am basing this opinion on the judgment of men of large affairs—we have seen the worst of the business depression and that we are now headed toward a much brighter year in 1922. There have been quite a few important happenings that have taken place during the year that are now having a good effect upon world business and will still have more effect as progress is made in putting into practice the real things that are now in the making.

Financial Situation Improving

The financial situation, which is a large factor at all times, we all well know is vastly improved. Discount rates have been lowered, the Federal Reserve Bank reserve is vastly improved, solvent concerns are able to finance themselves, and as a whole, so far as the United States is concerned, our financial structure is on a sound footing. A great many more factories in our line, as well as in many other lines, are in operation now than were a few months ago, some of them having orders as much as four or five months ahead. Labor is much more fully employed; wages are in some lines overpaid, especially the railroad labor, while in other lines labor is underpaid.

The labor question with us is one that should have at all times our very best thought, and we should try, so far as is possible, to pay our help in proportion to the cost of commodities which labor must buy, always keeping in mind the fact that labor not only produces practically all that is needed for the welfare of humanity, but that the money paid labor and the money of the farmer constitutes the larger part if our buying power in this country, as well as the world.

While these things that have been mentioned sound optimistic, there of course is another side to the situation, and one of the greatest reasons why we can not hope to get back to a large and settled business basis quickly is the financial situation in the Old Country. Their exchange is of little value, and badly as they may wish to trade with us, it is simply impossible for them to do so until their financial position is strengthened, and this can only be when they receive further financial assistance that is necessary to put them in a position to do business, and this assistance can only come from one country, and that country is ours.

Another fundamental difficulty that we must face is the difference between the price of farm products and all raw materials and the price of manufactured goods. As we have already stated, the farmer is one of our best customers, and so long as his products sell at a price below the cost of production, just so long will business be curtailed just in that proportion, and there can be no stable regular trade while this condition exists. Congress talks, and let us hope will put into operation some plan whereby the farmer may be relieved and thereby strengthen the situation.

Law of Supply and Demand

The labor unions would have us believe that the law of supply and demand has ceased to function. Nothing is further from the truth. It is working to-day in the labor world, always has worked and always will, and in our opinion is one of the greatest causes of the recent increased demand for veneer and panels. A very large per cent of the veneer and panel consumers were stocked with high priced goods and have been gradually working this stock down until they could see their way clear to place some orders, and if we are careful as sellers of veneer and panels and use our heads and do not attempt to push the price of our products to an unreasonable price, in our opinion, we will have for the next six months a healthy profitable business; but should we lose our heads, as we did in the past, the increased demand which has been noticeable for the past few weeks will stop just as suddenly as it came.

I trust that to-day in this meeting we may be absolutely frank with each other, talk over the situations with each other and go home with our minds made up to do, so far as is possible, our full duty as we may see it, not only in our own business, but in all the ways we can to help put the entire business world on its feet again, always bearing in mind the golden rule in business and ever keeping for our motto that of the Rotary Clubs of the World, "He profits most who serves best."

Average Spread of Glues

In determining the cost of any article the glue cost must not be overlooked for on certain classes of work, especially those calling for considerable quantities of plywood or veneers, it is an item of no small importance. The average glue spread for different kinds of glue, may be determined by observing how far the glue goes on various classes of work. Such knowledge, when properly tabulated, would be found very handy.

The following reports show the results of tests made by four manufacturers. While these figures may not be applicable to all plants or to all woods, they give an idea of what constitutes an average spread.

Factory "A"

"Our spread of vegetable glue is 41 feet, while hide glue runs 38 feet. This spread varies, depending on the core or center stock, Chestnut taking the greater spread, Pine a little less and hardwood still less, but this is the average. Of course, the vegetable glue is cold, while the hide glue is hot. We use roller spreaders."

Factory "B"

"Using a vegetable glue applied hot with a roller glue spreader on Western Pine and Spruce cores, we spread 38 square feet per pound of glue."

Factory "C"

"Our records show that we can spread 45 square feet from one pound of vegetable glue, while hide glue runs 40 square feet. We use roller spreaders for this work."

Factory "D"

"While we do not have any record of the total number of square feet one pound of glue will cover on panel work and the like, we can give you our experience for glue joining for width. Using a ground or a flake glue applied hot by hand brush on White Pine, Yellow Pine, Oak or Birch, one pound of glue will run 200 lineal feet of 1⅛" glue joint, or one pound will run 164 feet of 1⅜" glue joint."

	Spread per pound of glue	
	Hide Glue	Vegetable Glue
Applied to face surfaces		
Factory "A" Roller Spread	38 sq. ft.	41 sq. ft.
" "B" " "	38 "	
" "C" " "	40 "	45 "
" Total	116 "	86 "
" Average	38-2/3 sq. ft.	43 sq. ft.
Applied to edges	**Size**	
Factory "D" Hand Brushed	1-1/8"	200 lin. ft.
" "D" " "	1-3/8"	164 "

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

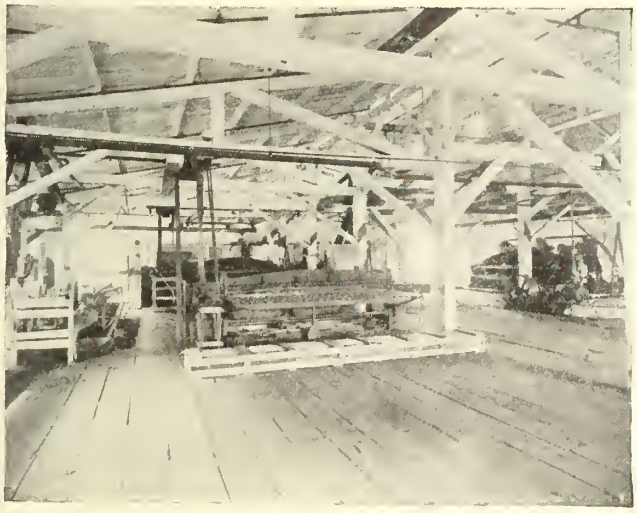
Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.

Mahogany and Walnut Veneers



Veneer department at New Orleans, La., showing 10-ft. Rotary and Clipper and 16-ft. Slicer in rear.

Chicago Offices — M. S. Johnson, 39 W. Adams St.

Toronto — Frank Moss, P.O. Box 356

Grand Rapids — Geo. A. Baker, Hotel Cody

THE FREIBERG MAHOGANY CO.

Offices and Warehouses:
CINCINNATI - OHIO

Saw and Veneer Mills:
NEW ORLEANS - LA.

Mahogany Importers and Manufacturers

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN.

Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.

(When writing mention Canadian Woodworker)

Prefer Plywood to Terms Veneered or Built-up

Plywood Manufacturers Endorse Former Term—Hope to Extend Plywood Cost Knowledge to Furniture Industry—Trend of Plywood Prices

The Plywood Manufacturers' Association held one of their quarterly meetings at Chicago, December 14th. A number of interesting questions were up for discussion, including cost methods, the publicity campaign, the new plywood glue, furniture definitions and the adoption of an association trade mark for use of members. A committee was appointed to consider uniting the veneer and panel manufacturing industry under one association by effecting a merger with the National Veneer and Panel Manufacturers' Association.

An outstanding feature of the meeting was the address of the President, Thomas D. Perry, of the Grand Rapids Veneer Works. Mr. Perry ably outlined the problems confronting the industry and various phases of the working with which the association is confronted. His address is as follows:—

Your president recently attended two meetings of the National Council of Furniture Associations at which several topics of interest to our members were under discussion. The September meeting at Hot Springs gave opportunity to explain at some length the status of our association glue development in which a keen interest was evidenced. At this meeting attention was also given to the designations or descriptions of different grades or constructions of furniture. Your president took the position that in the group entitled "Genuine", and indicated to include both solid and veneered woods, it would be advisable to make a two-line descriptive title, i. e.,

(GENUINE)
(Solid & Plywood)

He felt that long descriptions would seldom be read or remembered, but that the word "Genuine" needed something to strengthen it.

Uniform Descriptive Terms

The same topic was under discussion at a meeting held in Cleveland by the Associated Advertising Clubs at which the conclusion reached indicated the use of the word "Built-up", for one of the grades. It was impossible to attend this meeting, but our preference for the word "Plywood" was made clear to their secretary.

At the New York Council meeting in December still further consideration was given to the grade designation and an opportunity was given our association to again register its opinion for the use of the term "Plywood", because of its correctness, its general use and the difficulty and confusion attending the use of such terms as "veneered", "built-up"", "compound-wood", "multiple ply", etc. Our association must vigorously maintain its position on this subject, so that a proper conception may be developed in the minds of the public that "plywood" means several sheets of thin wood glued together, to enhance the beauty and increase the strength.

Plywood Price Deflation

At the Council meeting at Hot Springs, Cost Counsel, W. H. Coye, exhibited charts showing the price range of component materials entering into case goods dining tables, and chairs. Plywood was given a line in the first two charts, which nearly corresponded to the lumber line. In September the lumber line showed greater reductions than the plywood line but the last four months have given the lumber line an upward tendency while the plywood has continued its downward course.

The relentless process of price deflation has gone rather heavily on plywood manufacturers, and little interest is evidenced by them in the new tax legislation and the raising of the corporation income tax from 10 per cent to 12½ per cent. On every hand is a realization that costs must get down to normal, but no one has discovered any sure guide to the location of normalcy. The market on 13 16 in. 5-ply figured tops (I. G. S.) averages around 25 cents and on ¼ in. 3-ply birch panels (I. G. S.) around 9 cents, but the variations in vigorous competition have run 33 per cent under and the quality grades are securing 20 per cent more than the average. With unstable raw material prices and under-production, it is well nigh impossible to state whether the above averages will enable the manufacturer to get out whole or not. Many shrewd buyers are stocking up heavily on lumber, veneers and plywood, and the two former items have taken a distinct upward turn.

This is not a time to cast aside costing methods as useless, but to keep them in running order so that they may completely function again as the volume of production begins to stabilize the overheads. Foresight, judgment and nerve will carry us through this period and the worst is apparently behind us.

Work of the Committees

The reports submitted by the different committees indicate faithful work and are worth careful consideration. The Traffic Committee has made excellent progress in the hearing before the Interstate Commerce Commission examiner at Louisville on Docket No. 8131. The Glue situation is assuming more definite shape and the committee report indicates that experience is shaping a successful and satisfactory policy for a good glue at a reasonable price. Conditions have not been favorable for making progress in the matter of Grading Rules. The Publicity or Trade Promotion Committee has had a difficult problem in the failure of the National Veneer & Panel Association to meet its half of the assessment as agreed upon at their June meeting. Some means must be devised to "put over" the publicity program which has been so admirably started, and to which our Plywood members have definitely pledged their assessments.

Cost Engineer Potter has now finished the five sections of his "Costing Principles", to be revised and bound in a single book at some future date. The completion of this work puts us in a position to advocate its effective use in fields where it will be benficial to the plywood industry as a whole. There are three

(Continued on page 86)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

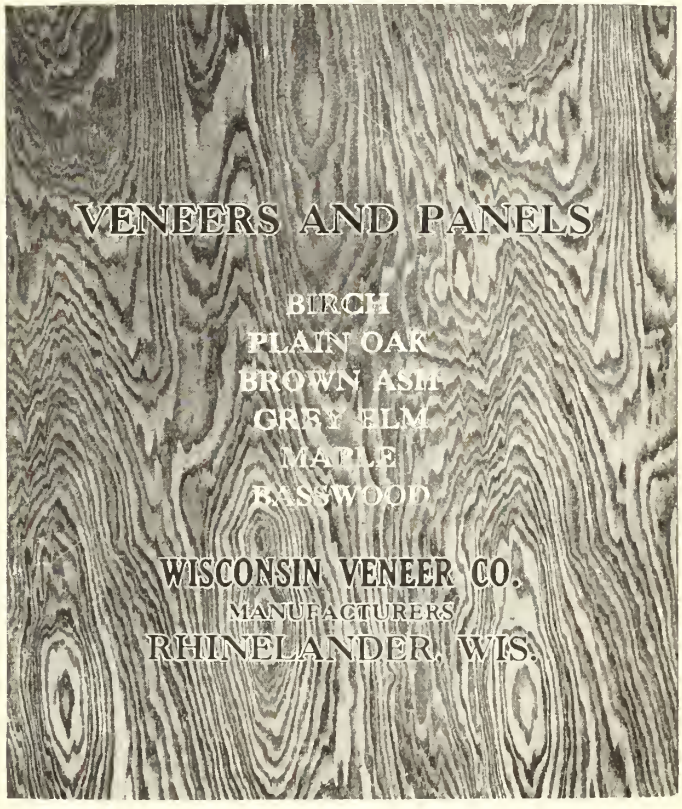
Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren. Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.



Litton Veneer Co.

Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill

ROCKFORD - ILLINOIS

J. W. Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers

Oak Lumber and Veneers

Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Poplar and Walnut

Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND.

HOFFMAN BROS. CO.

ESTABLISHED 1867 - INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car 1/20'	Red Oak (log run)
½	Car 1/16'	Red Oak (log run)
½	Car 1/20'	White Oak (log run)
½	Car 1/16'	White Oak (log run)
1	Car 1/28'	Walnut (half round)
25M	1/28'	Poplar Crossbanding
5	Cars 1/8'	Poplar (log run)
2	Cars 1/8'	Poplar (corestock)

Prices by wire on receipt of your inquiry

HB

Reg. U.S. Pat. Off.

FORT WAYNE, IND.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

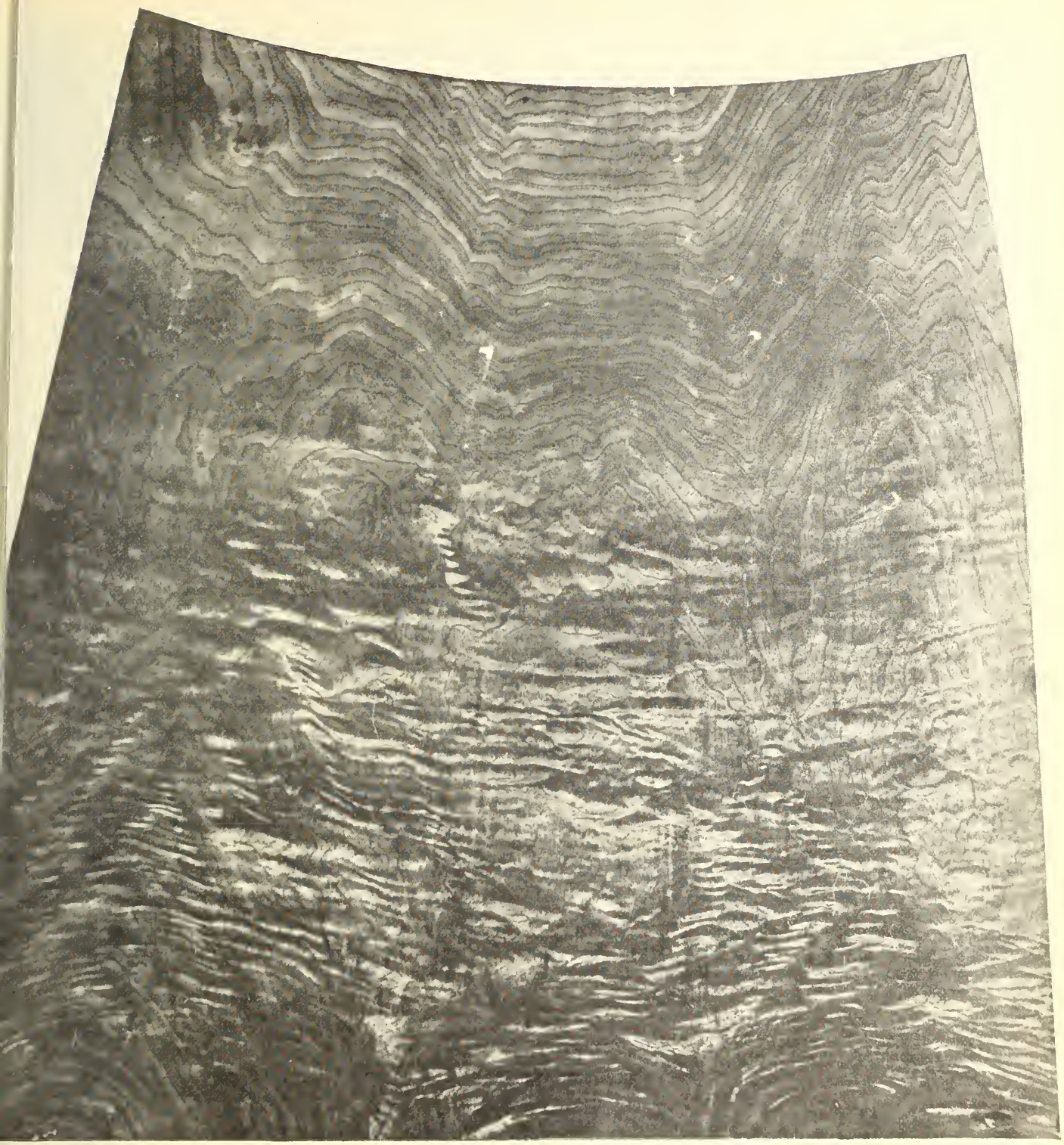
The Standard Veneer Co.
Portland, Maine

Wide Veneer

One carload of 1/20"
Quartered White Oak
Sawed Veneer
12" and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.



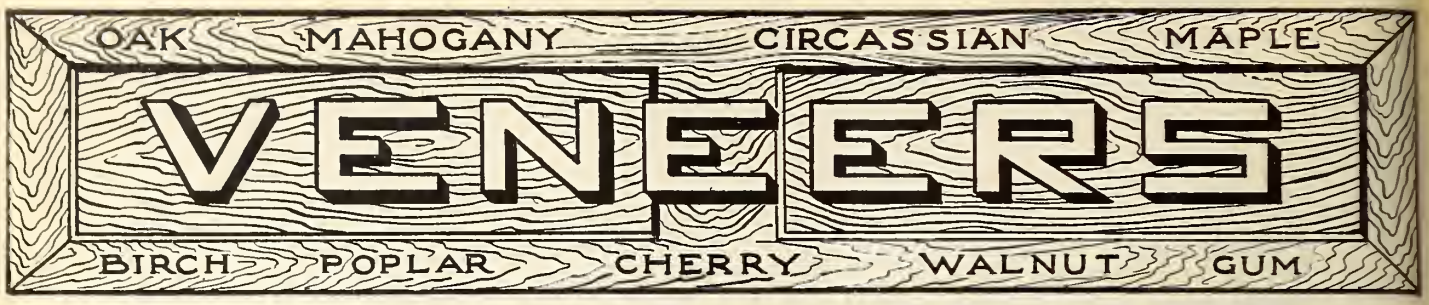
American Walnut Stump-Wood

Manufacturers of
Quartered Oak
Walnut Veneers

Walnut Stumps and Long Wood
Hardwood Lumber
All Thicknesses

F. M. Bachman Company

Indianapolis - Indiana



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Exclusive Manufacturers American Walnut Lumber and Veneers

AMERICAN BLACK WALNUT LUMBER

FAS—6-9¼" Wide, 8-16" Long

3/8"	3,750 Feet
1/2"	21,470 "
5/8"	44,140 "
3/4"	25,962 "
4/4"	82,502 "
5/4"	26,766 "
6/4"	39,201 "
8/4"	33,140 "
10/4"	14,245 "
12/4"	11,470 "
16/4"	3,700 "

FAS—10" and Up Wide, 8-16" Long

1/2"	9,680 Feet
5/8"	18,980 "
3/4"	14,430 "
4/4"	48,872 "
5/4"	14,165 "
6/4"	10,262 "
8/4"	16,920 "
10/4"	10,250 "
12/4"	1,800 "
16/4"	2,100 "

Fas—6"and Up Wide, 6-7 Feet Long

3/8"	1,200 Feet
1/2"	5,790 "
5/8"	840 "
3/4"	8,940 "
4/4"	32,400 "
5/4"	2,300 "
6/4"	7,800 "
8/4"	1,500 "
10/4"	1,400 "
12/4"	500 "
16/4"	400 "

SELECTS

4/4"	32,940 Feet
5/4"	27,530 "
6/4"	21,480 "
8/4"	33,590 "
10/4"	16,850 "
12/4"	6,054 "
16/4"	1,832 "

NO. 1 COMMON

3/8"	8,000 Feet
1/2"	27,380 "
5/8"	29,850 "
3/4"	31,285 "
4/4"	59,675 "
5/4"	38,240 "
6/4"	18,750 "
8/4"	39,240 "
10/4"	16,363 "
12/4"	4,768 "
16/4"	1,604 "

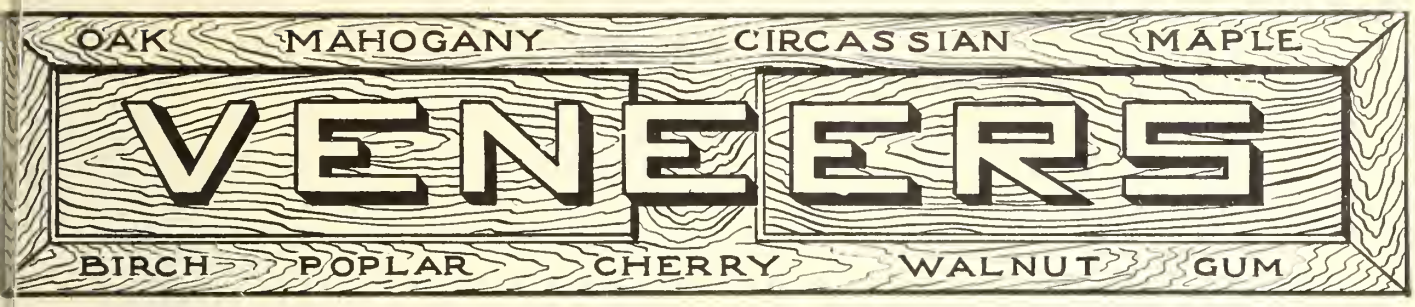
NO. 2 COMMON

3/8"	1,500 Feet
1/2"	1,900 "
5/8"	4,500 "
3/4"	2,190 "
4/4"	72,250 "
5/4"	47,890 "
6/4"	31,720 "
8/4"	35,940 "
10/4"	19,140 "
12/4"	20,116 "
16/4"	16,088 "

Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.



VENEER MANUFACTURERS COMPANY
IMPORTERS MANUFACTURERS

Our Carefully Selected Line of
ROTARY CUT SLICED AND SAWN FIGURED AND PLAIN VENEER

As well as the Wonderful Assortment of
PLYWOOD PANELS
Invites Your Attention

THE FINEST STOCK ON THE MARKET TO-DAY
At Fair Prices and Fair Terms

Watch for The Veneer Price-Stock List.

1036 W. 37th. St. Chicago, U. S. A.

QUALITY *SERVICE*

PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut
Exclusively

Woodruff and River *New Albany, Ind.*

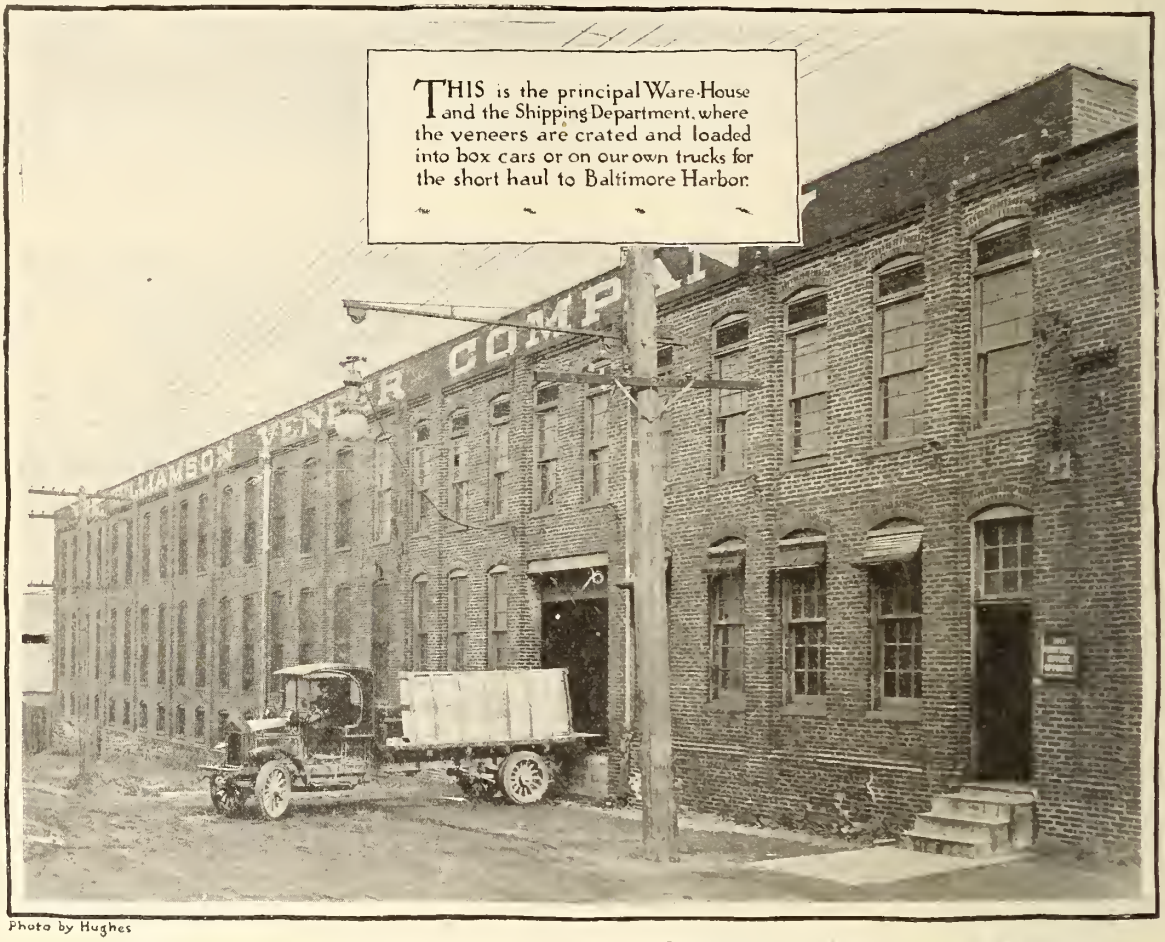

THIS is the principal Ware-House and the Shipping Department, where the veneers are crated and loaded into box cars or on our own trucks for the short haul to Baltimore Harbor.

Photo by Hughes

Quality VENEERS

in WALNUT BUTTS
BURLS · OAK · POPLAR
LONG WALNUT &
MAHOGANY ETC.

Mills – Baltimore, Md.

Sales-Branches:

NEW YORK (709 SIXTH AVENUE) HIGH POINT
CHICAGO (28 E. JACKSON BOUL'V'D.) JAMESTOWN

THE WILLIAMSON VENEER CO.

VIEWS OF OUR PLANT No. 7.

H G W. D.

ALGOMA *the Better* Plywood

Circassian Walnut! It's been like opening a Captain Kidd treasure chest to cut these rare logs at Algoma—like lifting the lid on precious gems to see the surpassing beauty of graining opened before our eyes.

Frankly, these logs have exceeded even our hopes and expectations—they will surpass yours. Circassian Walnut has been off the market since 1914. However, the quality of the logs we are now cutting amply rewards us for the seven long years we have waited.

We take justifiable pride in having secured this shipment from far Caucasus—and the finest skill of our workmen is called upon to bring out the fullest matching possibilities of this supreme wood.

Circassian Walnut panels—Algoma made—are ready for you in any size you wish to order.

ALGOMA PANEL COMPANY, *Algoma, Wis.*

Prefer Plywood to Terms Veneered or Built-up

(Continued from page 78)

distinct opportunities now apparent: First, the plywood manufacturer who is still guessing at his costs. It is a fact that only about one plywood member in eight knows his costs accurately. Second, the veneer producer who knows even less of his actual costs than the plywood man. Mr. Potter's outlines include the principles of costing for rotary, sawn and sliced veneers. When veneer makers begin to realize and use even rudimentary costs, there will come a stabilization of prices that will benefit all. Third, the furniture manufacturer. Rare indeed is the maker of furniture who apportions to his plywood assembling department the proper overhead burdens that make his internal cost really comparable with that of the outside plywood specialist.

Our cost engineer's work has been thorough and has received commendation wherever it has been studied. Our job is to capitalize this investment in a large way. We should begin to do this in our own organization by putting the principles and practices which have been set forth in the cost manual into actual practice in as many of our member plants as possible. We should also wage a vigorous campaign for accurate and uniform costing, not only on the part of these who supply us with raw material, but on the part of those who use our product as well. Unless we do this, and educate woodworkers along these lines, we are failing to earn a suitable revenue from our investment.

The task is no small problem and is worthy of our mettle, but ways and means must be devised for such a campaign. The three projects can be carried along simultaneously and the quality of the service may be made such that everyone in the three classes enumerated will want the results, and will not be satisfied until he gets them.

Need of Protected Trade Mark

A trade mark has been under consideration for the Association for some little time, and there is a need for authorizing the use of an approved label on our standard glue, and your president believes that a decision on this point should be made. The design shown is submitted as a suggestion. The form is reasonably simple, the date of the original organization of the Panel Club with the re-organization of our present Association appearing with the initials. In order to legally protect this it should be properly copyrighted in the United States patent office.

The necessity for adopting standard names or titles for the approved grade or grades of glue and the authorizing of the form in which these names shall be used will come up in the immediate future and it would be your president's suggestion that this question of nomenclature and designation be referred to the glue trustee with full power to act, notifying the members promptly of decisions reached.

Your president feels deeply the degree of co-operation extended to him individually and collectively by our officers and members in the various activities of our Association. The election of new officers is due at our next meeting in March—three months hence—and I am firmly convinced that the best interests of the Association will be served by limiting the term of any resident to not over three years. Perhaps past presidents should be made ex-officio members of the Executive Committee to help in correlating the work.

Afraid of a Run-away Market

Practically every hardwood lumber manufacturer in the various producing centres has the fear of what they term a "run-away" market. They know that if there is a sudden demand on the manufacturers for lumber, on account of the shortage, prices are going to jump way out of proportion to what they should be, which will, of course, be governed by the laws of supply and demand. Just as sure as the prices do run up high, it is going to affect general buying and there will be a worse slump than we had in 1921. If the lumber buyers would only place their orders for their legitimate requirements now and gradually, it would not have a bad effect on the market. The lumber manufacturers are doing their best to get stocks of dry hardwoods on hand but with the rainy season almost upon them in the south and very few available logs, it is a hard proposition.

100% EXCELLENCE
Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK
Years of Experience Behind Our Products
The Munising Woodenware Co.
MUNISING, MICH.

SEE OUR ADVERTISEMENT PAGE 110
VENEER MERIT MACHINERY
VENEER MERIT MACHINERY
FOR FAR SIGHTED BUYERS

Superior Veneers

Outstanding features which are responsible for the superiority of our Veneers

MATERIAL — Experience of years used in carefully selecting timbers of character.

STEAMING — Properly prepared by steaming in thermostatically controlled vats.

CUTTING — Perfect cutting. Eliminating waste.

DRYING — Textile machines used to dry evenly and thoroughly.

Entrust your next veneer requirements to our care and be convinced of the efficient service and prompt attention rendered every order.

WOOD-MOSAIC COMPANY
INCORPORATED

LOUISVILLE, KENTUCKY

REPRESENTATIVE
H. ROBERTSON
232 Lyon St. N. W.
GRAND RAPIDS

REPRESENTATIVE
GEO. W. STONEMAN & CO.
845 W. Erie St.
CHICAGO

Information and Inquiries

You are cordially invited to make use of this department

Directions for Burnishing Picture Frames

Wilmington, Delaware,
Dec. 14th, 1921.

Editor, "Canadian Woodworker."

On the information page of the October issue of the "Canadian Woodworker and Furniture Manufacturer," there appeared a request for information on bronzing and burnishing picture frames. We are outlining a process as used by one manufacturer. This is a proven method and if the directions are followed carefully, good results are assured. You are at liberty to publish this information.

Sincerely yours,
Celluloid Zapon Co.

1—Sand the frame until it is smooth.

2—Mix up a small quantity of fine Gilders Whiting with a very weak solution of hot glue and water. Apply two coats. The glue solution must be very weak otherwise it will chip and crack off from the frame.

3—Sand this down after it is dry with a very fine sand paper, until it becomes smooth.

4—Take Red or Blue burnish size, mix with it a very weak solution of hot glue and water. Apply two coats. If this appears rough after it is dry, rub lightly with fine sand paper.

5—Take burnish gold bronze, mix a small amount of alcohol with it into a paste form, then add a weak solution of hot glue and water. Stir well while doing it. Always apply hot if you want good results. The best way is to keep the cup in hot water—that keeps it from chilling. Give two coats of bronze, letting first coat dry before applying the second.

6—Let dry for about 5 hours then rub lightly with the agate burnisher, which must be prepared by rubbing the agate on a piece of leather with emery and crude oil until the glassy finish on it is removed. Then you are assured of good results.

7—Apply a coat of H. G. Lacquer on top of the bronze and frame is complete. If you want to tone down the bronze to make it look antique, apply a thin coat of Japan colors, whatever shade is desired. Burnt umber is largely used. Thin with benzine, apply to the frame and wipe off the high lights.

Rosewood Veneer Wanted

St. Thomas, Ont.
Dec. 19th 1921.

Editor, "Canadian Woodworker."

Will you kindly inform us where we could secure some rosewood veneer, also wooden wheels for tea wagons?

Sincerely yours,
G. Webber.

Rosewood veneer is rather scarce at the present time. Would suggest you write the Toronto Veneer Co., Toronto, as they sometimes have a stock of rosewood on hand. Wooden wheels for tea wagons do not seem to be on the market. As far as we know each manufacturer of these wagons makes his own wheels. The Faultless Caster Co., of Evansville, Ind., make a metal swivel wheel with a felt tire, which is used on tea wagons, and it is possible that these might suit your requirements. You might try George Bilton, Sackville Place, Toronto. He specializes in tea wagons and might be willing to supply you with wheels of his own manufacture.

Who Makes Battery Separators?

Indianapolis, Ind.
Dec. 23rd, 1921.

Editor, "Canadian Woodworker."

In the "Canadian Woodworker" of August you published an article dealing with wood separators in the last paragraph of which it was stated that at the present time at least two companies are working on this proposition. Would you kindly favor me with the names of these two firms and also any other Canadian manufacturers making these separators?

Yours very truly,
E. P. Borcherding.

The B. C. Separator Mfg. Co., New Westminster, B. C., and the O. Spanner & Co., Elm St., Toronto, are the two firms to which reference was made in this article. We believe that Lyons Bros., 16 Plymouth St., Toronto, manufacturers of battery boxes, are preparing to make separators.

Equipment to Make Wood Heels

60 St. Urbain St. Montreal, Que.
Dec. 29th, 1921.

Editor, "Canadian Woodworker."

What machinery would you advise as best adapted to the manufacture of wooden heels for ladies' shoes? If possible, kindly give description of such machinery with approximate cost and also state where the equipment may be obtained.

Sincerely yours,
Montreal Cabinet Co.

Wood heels are produced by a number of special shaper operations. This requires special equipment. Would suggest that you get in touch with the Goodspeed Machinery Co., of Winchendon, Mass., as they are manufacturing a line of modern heel-making equipment.

Lamp Shades Wanted

Brantford, Ont.,
Grandview P. O., Dec. 15th, 1921.

Editor, "Canadian Woodworker."

Will you kindly give me the names of manufacturers of lamp shades? I am making a line of lamps and am desirous of securing suitable shades.

Sincerely yours,
L. Brown.

It is just possible that the Baetz Bros. Specialty Co., Limited, Kitchener, Ont., or G. L. Irish, Queen St., Toronto, can supply you with your requirements in this line.

Canadian Plywood Wanted

A Manchester firm is open to purchase large quantities of Canadian plywood if prices and quality are right. Inquiry 3722.

In the Market for Staves

A London firm with connections in the Argentine are in the market for oak staves for 200 litre, wine barrels, weight of barrel to be 27 kilogrammes. Inquiry 3724.

Toronto Veneer Company Ltd.

(Operating Panels, Limited, Southampton, Ont.)

Office and Veneer Warehouse:
1100-1104 Queen St. West
Toronto

Lumber Yard:
Atlantic Ave. and G.T.R. tracks
Toronto

PATENT "RIM-BOUND" TABLE TOPS

Five Ply Table Rims

PANELS 3 AND 5 PLY IN ALL WOODS.

MAHOGANY AND WALNUT, QTD OAK VENEERS Plain Rotary Veneers always in stock

TORONTO LUMBER STOCKS

MAHOGANY

20,000′	4/4	1s & 2s
14,880′	4/4	No. 1 Com. & Sel.
3,065′	5/4	1s & 2s
3,136′	5/4	1s 1 Com. & Sel.
6,045′	6/4	1s 1 Com. & Sel.

BLACK WALNUT

26,485′	4/4	x 10″ /up 1s & 2s
32,265′	4/4	x 6-9¾″ 1s & 2s
17,584′	4/4	No. 1 Com. & Sel.
12,762′	5/4	1s 2s
14,407′	5/4	No. 1 Com. & Sel.
13,383′	6/4	1s & 2s
13,269′	6/4	No. 1 Com. & Sel.
13,824′	8/4	1s & 2s
12,970′	8/4	No. 1 Com. & Sel.

WHITE WALNUT

284′	4/4	1s & 2s
255′	4/4	No. 1 Com. & Sel.
171′	4/4	No. 2 Com.

SOFT YELLOW POPULAR

21,288′	4/4	1s & 2s
30,924′	4/4	Saps & Select
9,825′	4/4	No. 1 Common
12,752′	5/4	1s & 2s
8,600′	5/4	Saps & Select
6,447′	5/4	No. 1 Common
4,762′	6/4	1s & 2s
2,951′	6/4	1s & 2s
6,736′	6/4	No. 1 Common
4,426′	8/4	1s & 2s
7,838′	8/4	Saps & Select
4,207′	8/4	No. 1 Common
2,012′	10/4	Select
7,047′	10/4	No. 1 Common
4,195′	12/4	1s & 2s
3,081′	12/4	Saps & Select
4,558′	12/4	No. 1 Common

QUARTERED WHITE OAK (Soft Indiana)

15,968′	4/4	1s & 2s
28,053′	4/4	No. 1 Com. & Sel.
15,000′	4/4	x 2½-5½″ Clear Strips
14,431′	5/4	1s & 2s
34,500′	5/4	No. 1 Com. & Sel.
11,320′	6/4	1s & 2s
17,000′	6/4	No. 1 Com. & Sel.
11,430′	8/4	No. 1 Com. & Sel.

PLAIN WHITE OAK (Soft Indiana)

25,020′	4/4	1s & 2s
13,431′	4/4	No. 1 Com. & Sel.
12,955′	5/4	1s & 2s
12,975′	5/4	No. 1 Com. & Sel.
12,974′	6/4	1s & 2s
12,505′	6/4	No. 1 Com. & Sel.
12,185′	8/4	1s & 2s
12,288′	8/4	No. 1 Com. & Sel.

QUARTERED RED OAK (Soft Indiana)

22,684′	4/4	1s & 2s
9,139′	4/4	No. 1 Com. & Sel.
3,688′	4/4	No. 2 Common

PLAIN RED OAK (Soft Indiana)

13,035′	4/4	1s & 2s
21,124′	4/4	No. - Com. & Sel.
12,425′	5/4	1s & 2s
12,795′	5/4	No. 1 Com. & Sel.
9,778′	6/4	1s & 2s
10,365′	6/4	No. 1 Com. & Sel.
12,090′	8/4	1s & 2s
14,300′	8/4	No. 1 Com. & Sel.

PLAIN RED GUM

17,672′	4/4	No. 1 Com. & Sel.
9,247′	6/4	No. 1 Com. & Sel.

PLAIN SAP GUM

18,000′	4/4	x 13″ /up 1s & 2s
18,000′	6/4	1s & 2s

QUARTERED RED GUM

21,370′	6/4	1s & 2s
12,329′	6/4	No. 1 Com. & Sel.

QUARTERED RED GUM S. N. D.

15,198′	4/4	1s & 2s
8,160′	5/4	1s & 2s
8,969′	8/4	1s & 2s

We are prepared to quote attractive prices on the above, and if required, can kiln-dry and dress any of this to your order.

We are prepared to quote on anything in Hardwoods for shipment direct from the mills in car lots, and solicit your inquiries. We are cutting Gum, Chestnut, Walnut and Mexican Mahogany, and have dry stocks at Jackson, Tenn. and Indianapolis, Ind.

The Lumber Market

Domestic Woods

The usual January lull is being experienced in local lumber centres. True, a certain amount of stock is moving and a satisfactory volume of inquiries are being received but little new business is being placed. Stock-taking and buying do not seem to go hand-in-hand, and this is stock-taking time. Logging conditions are good and if things were anything like normal, a large log output would be expected. Owing to the unsettled condition of the lumber market, the majority of lumbermen are acting with extreme caution. It is estimated that the cut of hardwood for the winter season will be about 50 per cent of that brought out last year, while the cut of softwoods may run 60 to 70 per cent of last season. This will work against the accumulation of any large stocks of lumber during 1922.

In softwoods hemlock is holding very firm. Many, who have quantities of this wood in stock, are convinced that its value will increase within the next month or two, and as a result are inclined to hold out for their price. White pine stocks are light with the exception of mill culls. No. 1 mill culls have been moving recently, and as soon as the box industry opens up, it is anticipated that No. 2 culls will rapidly disappear. Some of the better grades of pine are decidedly scarce. Spruce is weak with little or no demand.

Hardwoods are showing up better. Birch and maple are being sought by furniture and flooring manufacturers. The hardwood branch of the industry is confronted with a surplus of No. 2 and 3 common, while firsts and seconds and selects are scarce. It is probable that the price of the upper grades will show signs of stiffening. Many who have better-grade hardwoods in stock, are holding out for a fair price. On the whole there seems to be less disposition on the part of buyers to haggle over prices. They seem to have realized that lumber values have touched bottom and their concern is to secure the stock and grades they require.

Imported Woods

The status quo holds in the various American hardwood circles. The past few weeks have not witnessed any material change in the situation. Hardwood lumber values are firm at the high points reached during the past two months, and as business opens up and develops it will not be surprising if other increases are noticed. There is a fair volume of lumber moving though buying is light at this time of writing. Reports from different centres indicate that inquiries continue to come in at a satisfactory rate. It is thought that as soon as the inventory period is past, many buyers will come in in earnest with a corresponding improvement in market conditions. Production has been on the increase though it is still below shipments, which means that stocks are being still further depleted. Conditions in some of the logging centres are hindering operations so that the input of logs to many mills is light.

The furniture markets which are being held at various centres are, judging from early reports, proving up to the expectations, and in all probability a nice volume of business will result. If this proves correct, it cannot help but have a strengthening effect on the lumber situation, as it will bring the furniture buyers into the market in force. As has been emphasized in these columns on more than one occasion, any marked increase in demand, even on the part of any one industry, cannot help but be reflected by an upward movement in prices. In this connection the automobile industry is exhibiting signs of life and may soon become an important factor in the field.

Memphis, Tenn. Reports from this district suggest that from the inquiries and orders being received business will have a turn for the better during the next few weeks. One feature of the market is the growing number of export inquiries. All prices are holding firm and lumber operators are of the opinion that still further advances are about due. Weather conditions are interfering with logging, and as a result all efforts to increase production and build up well-assorted stocks are not meeting with much success. The first six months of the year are expected to witness an active call with stiffening prices.

Louisville, Ky. A slowness prevails in this centre although inquiries, which have every appearance of being bona fide, are numerous. The automobile manufacturers are taking note of conditions, and it is expected that a certain amount of buying will be done by them in the near future. For this reason ash is considered good stock and prices on this wood are very firm. Such woods as walnut, gum and oak are in fair demand although they are not moving as freely as they did a short while ago. FAS. prices at Louisville, are,—plain red gum 4/4 $110.00; quartered red gum, 4/4, $115.00; sap gum 4/4, $50.00; ash, 4/4, $85.00; quartered oak, 4/4, $140.00; plain oak, 4/4, $110.00; poplar, 4/4, $110.00; common oak, plain, $55.00.

Buffalo, N. Y. Wholesale dealers in this centre are anticipating an early revival of buying though at the moment things are very dull. As this is usual during the early part of the year, an optimistic attitude is everywhere visible. The prospects for business are considered to be much better than in January 1921, as values are on a more stable basis. It is thought that slight advances are probable.

Evansville, Ind. During the past ten days trade with the lumber manufacturers of southern Indiana, southern Illinois and western and northern Kentucky has been sluggish. This is supposed to be the usual new year lull. Heavy rains and floods have seriously interfered with logging in the southern States, with the result that manufacturers are finding it very difficult to increase production. There is a considerable degree of optimism in these districts as it is felt that 1922 will witness a revival of the lumber industry on something like a normal scale.

One of the chief duties of the Sales Manager is to give his men constructive help in their work. If a sales manager cannot help his salesmen make sales, what is he for? I have three sales managers in my business, one for each division. Each of them when he visits an agency helps the man there to make sales. If he could not he would not be the sales manager. I do not mean for him to go out and canvass the stores, I mean he is everlastingly gathering material and thinking, so that he has something to take out with him and say "Put this down in your note book."

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

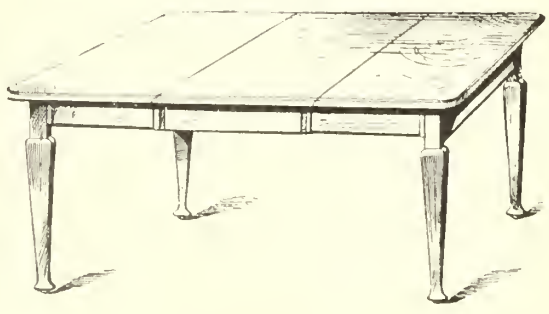
LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

PROMPT delivery in any quantity at very attractive prices. Just let us know your requirements and we shall be glad to forward quotations.

Panels are made in Walnut, Quarter Oak, Birch, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.



HAY & CO., Limited Woodstock, Ont.

News of the Trade

The sash and door factory of W. Chicoine, Rigaud, Que., was destroyed by fire.

Davies & Baskerville, Swift Current, Sask., have opened up a general upholstering shop.

Alex. Watson has opened an upholstering shop at 872 St. Catherine St West, Montreal.

The Laidlaw Bale Tie Co., of Hamilton, Ont., are distributing an attractive and useful office calendar.

Allard & Desnoyers Co., Montreal, who operated a sash and door factory, have dissolved partnership.

Thomas Findley, Toronto, former president of the Massey-Harris Co., Ltd., died recently at his home in that city.

The basket manufacturing business conducted at Thessalon, Ont., by J. E. Asam, has been taken over by J. E. Asam & Co.

R. Magwood, of the F. E. Coombe Furniture Co., Limited, Kincardine, Ont., was returned reeve in the elections recently held.

The Northern Varnish Co., Limited, Owen Sound, Ont., are sending an unusually attractive calendar to their friends in the trade.

The "Canadian Woodworker" is in receipt of an attractive greeting card from the Barr-Holaday Lumber Co., Greenfield, Ohio.

A. E. Malcolm, manager of the Andrew Malcolm Furniture Co., Limited, Listowel, Ont., was recently re-elected mayor of that town.

Chas. Baetz, of the Baetz Bros. Furniture Co., Limited, Kitchener, Ont., was re-elected alderman at the recent municipal elections.

The Perkins Glue Co., Lansdale, Pa., remembered their friends in the industry this year, with an attractive and useful solid leather billfold.

W. L. Kramer, eastern district sales manager of the Marietta Paint & Color Co., Marietta, Ohio, recently passed away at Williamsport, Pa.

The planing mill of Morin & Frere, Cap De La Madeleine, P.Q., was recently destroyed by fire. Loss $15,000. Owners plan on rebuilding.

J. E. Gardner, Galt, Ont., who is a member of the firm of P. W. Gardiner & Son, door manufacturers, has been re-elected an alderman for 1922.

Heintzman & Co., Limited, Toronto, manufactnrers of high grade pianos, recently installed a C.M.C., No. 6111, straight edging and jointing saw.

Artrola Co., Montreal, gramophone manufacturers were recently registered with Omer Laganiere and Arthur Levesque as the company incorporators.

C. Erb and J. Heinbuch have acquired the Baptist Church at Tavistock, Ont., and contemplate changing it into a planing mill and sash and door factory.

John C. Hackson, 398 Lincoln Road, Walkerville, Ont., is building a small addition to his plant and is in the market for a band saw and an arm sander.

The Valley City Seating Co., Limited, Dundas, Ont., recently shipped a handsomely-carved quartered oak altar to the St. Peter's Church, Tecumseh, Mich.

The Rose Furniture Polish Company, Quebec, P. Q., have been granted a provinc'al charter to manufacture and deal in all kinds of oils, varnishes and furniture polishes. Capital $49,000. T. F. Bourque and J. G. Bourque, both of Quebec City are two of the incorporators.

The Williamson Veneer Co., Baltimore, Md., remembered their customers with a very attractive greeting card wishing them health and prosperity during 1922.

R. Truax, Son & Co., Walkerton, Ont., recently completed a new sash and door factory and planing mill. The new building is 310x60 feet, of brick construction.

A new box factory is being equipped at Laidlaw, B. C., where a Mr. McKay and associates have built a mill and are installing modern box-manufacturing equipment.

The Fairbank Lumber & Coal Co., Fairbank, Ont., are building a two-storey planing mill, 50 x 60 feet, and are in the market for the necessary machinery and equipment.

J. H. McDonald, manager of the B. C. Manufacturing Co., Limited, New Westminster, B. C., managed to secure several large orders for boxes recently while on a business trip to Eastern Canada.

Samuel Pannabecker of Hespeler, Int., recently d'ed at the age of 77 years. The deceased was a well known resident of that town where he was engaged in the manufacture of carriages for many years.

Meaford Mfg. Co., Limited, Meaford, Ont., recently shipped seven carloads of furniture to the Robert Simpson Co., Toronto. This is one of the largest shipments of furniture that has left Meaford for some time.

The Gerrard Wire Tying Machine Co., Limited, Hamilton, Ont., had one of their wire tying machines on view at the annual convention of the Canadian Lumbermen's Association, which was held at Toronto recently.

Wm. H. Bradley recently passed away at his home at Nashwaak Village, N. B. Mr. Bradley was widely known, having been connected with various enterprises, included among which are a carriage factory and an axe factory.

The ratepayers of Kincardine, Ont., recently carried bylaws granting an extention of tax exemption to the Andrew Malcolm Furniture Co., Limited, and the F. E. Coombe Furniture Co., Limited, for a further period of ten years.

The Canada Car & Foundry Co., Montreal, recently secured an order for repairing 2,000 cars for Canadian National Railways. The work will be divided between the Fort William works and the Montreal and Amherst plants.

The annual meeting of the Canadian Broom Manufacturers' Association was held at the Queen's hotel Toronto, on December 29th. H. H. Stevens of Port Elgin, Ont., was re-elected president and W. I. Thomas, Ingersoll, Ont., secretary.

Palm Grip Rim Co., Limited, Montreal, has been granted a federal charter to manufacture and deal in carriages, trucks, boats and other vehicles. Capital $100,000. Two of the incorporators are A. R. Plimsoll, and M. T. Burke, both of Montreal.

A federal charter has been granted to the Dominion Wood Specialties, with a capital stock of $50,000 and headquarters in Montreal. The company is enpowered to manufacture and deal in lumber, wood and wood products of all kinds, and all articles of which

Which?

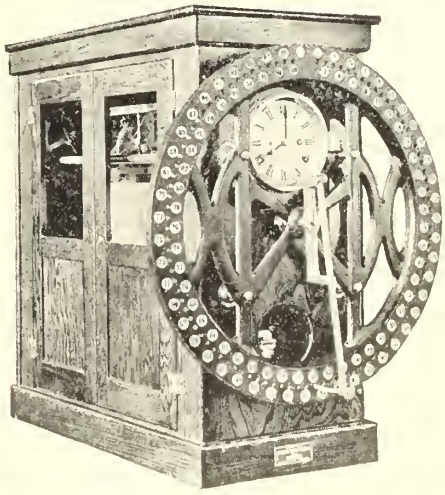
WHAT a difference there is between these two systems. The one always suggesting the possibilities of errors—the other printed in clearcut, legible type, unchangeable and always accurate; the one still in use by some firms, the latter adopted as a standard method of timekeeping by those who realize the advantages of knowing at a glance the amount of time they have purchased.

The loss of time which is encouraged by the former system would, in a short time, pay for an "INTERNATIONAL". Let us prove it.

We would like to have an opportunity to demonstrate to you that International Time Recorders and International Job Time Recorders are indispensable where it is desirable to have an accurate check of purchased labour at all times. May we send our literature, or have one of our representatives call?

Inaccurate, smudgy, changeable, pencil records

—or—



Accurate, clear, unchangeable, International records

International Business Machines Co.

LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 29 Dock St. QUEBEC, 506 Merger Bldg MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, Room 8, 36 James St. S. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd. WINNIPEG, 227 McDermott Ave. VANCOUVER, 230 Cambie St. SASKATOON, 254 Third Ave. S.

Also manufacturers of International Dayton Scales and International Electric Tabulators

wood forms a part. Among the incorporators are John F. Forman, Ernest Lindelius, Montreal, and Chas. H. Ancrum, of Westmount.

George Tilson, Sr., Tillsonburg, Ont., recently passed away in his 61st year. Mr. Tilson was the founder of Tillsonburg. He was actively connected with the Tilson Milling Co., which operated a planing mill in connection with their other activities.

The Pronvost Universal Wheel Co., Limited, Montreal, was recently granted a federal charter to manufacture all kinds of wooden wheels. Capital $750,000. Two of the incorporators are J. D. Kennedy, broker, and C. B. Reilly, barrister, both of Montreal.

La Cie Industrielle de Trois-Pistoles, Trois Pistoles, Quebec, have been incorporated to manufacture and deal in sash and doors and other wooden building materials. Capital $15,000. J. Belzil and J. Larrivee, both of Trois-Pistoles, Quebec, are the incorporators.

P. W. Gardiner & Sons, Limited, Galt, Ont., have been incorporated to take over the business known as P. W. Gardiner & Son, and to manufacture and deal in lumber products, chiefly doors. Capital $500,000. P. W. Gardiner and J. E. Gardiner are two of the incorporators.

E. C. Atkins & Co., Hamilton, Ont., report that they have made a substantial reduction in the price of their Sterling Quality saws, both in the territories covered by their Eastern travellers, and in British Columbia. In the latter place, they have a very complete shop and a large stock, at 109 Powell St., Vancouver.

W. W. Hill, 15 Nickle Ave., Mount Dennis, Ont., is erecting a small woodworking shop. He proposes to manufacture a patent combination child's crib and store and office fixtures. For the present he has put in a combination Elliott woodworker, and in the near future proposes adding a band saw, shaper and planer.

Snyders, Limited, Waterloo, Ont., have been authorized by supplementary letters patent to acquire the Snyder Bros.' Upholstering Company, Limited, and to manufacture and deal in all kinds of upholstery goods. Capital $600,000. H. M. Snyder and A. H. Snyder, manufacturers, are among the incorporators.

The employees of the Boeckh Co., Limited, Toronto, manufacturers of brushes, recently showed their appreciation of the interest taken in their welfare by the firm, by presenting the president, E. C. Boeckh, with an illuminated address. Disability and life insurance policies were recently taken out for all employees.

The ratepayers of Listowel, Ont., recently passed a by-law granting partial exemption from taxation to the Andrew Malcolm Furniture Co., Limited, of that town for a period of years. Now that this by-law has passed, it is the intention of this company to commence the erection of new dry kilns and also a new warehouse.

The North American Lumber and Supply Co., of Winnipeg, are issuing a useful calendar. In addition to the date pad, it includes a memorandum pad with a space for each day of the year. The calendar is intended primarily for rural distribution among the friends and customers of the company and will be appreciated no doubt, by all recipients.

The F. E. Coombe Furniture Co., Limited, Kincardine, Ont., are considering building an extension to their factory. This will take the shape of a three-storey addition 50x100 feet. It is just possible that this work will be undertaken during the coming summer, although it will depend largely on the cost of building together with general business conditions.

E. B. Salyerds, Preston, Ont., whose hockey stick and brush factory was recently destroyed by fire, has taken over the plant formerly occupied by the Canada Machinery Corporation, and will put in the equipment necessary to carry on the manufacture of his line. Mr. Salyerds has secured a lease of this building and will resume manufacturing operations at the earliest date possible.

The Durham Furniture Co., Limited, Durham, Ont., remembered all their employees at Christmas time. The married men were each presented with a goose, the single men with neckties and the female employees with silk hosiery. Over one hundred geese were distributed in this way. These gifts came as a pleasant surprise and were appreciated by the recipients.

The plant of the B. C. Separator Co., Limited, manufacturers of wood separators for storage batteries has been moved from Eburne, B. C., to New Westminster, B. C. This company has been reorganized under the management of J. H. McDonald. Additional machinery is being installed and the company are in shape to undertake production on a comprehensive scale. This is the only plant in B. C. making battery separators.

The Pickrel Walnut Co., St. Louis, Mo., manufacturers and dealers in walnut, have issued a decidedly novel and useful wall calendar.. It consists of an attractive, well finished (duo-tone), walnut panel 11 in. by 20 in., upon which is printed in gold lettering the name and address of the company. The calendar proper takes the form of a pad with particularly large numbers. This calendar would form a welcome addition to the wall decorations of any office.

Arthur B. Cowan, Galt, Ont., recently passed away at his home in that city,, in his 75th year. The late Mr. Cowan was well known in the woodworking machinery field, having been actively connected with Cowan & Co., of Galt, Limited, from its inception until he retired four years ago. He was known by woodworkers from coast to coast, having travelled for forty years. Mr. Cowan is survived by two brothers, William and James, and one sister, Miss Margaret Cowan.

T. F. Fitzgerald who is in charge of the local offices of the Canadian Edison Phonographs, Limited, St. Thomas Ont., was recently in conference with the executives of the United States firm at East Orange, N. J., where he learned that no definite plans had been made for the opening of the Canadian plant at St. Thomas. However, Mr. Fitzgerald is hopeful of seeing the plant in operation sometime during the coming summer or fall.

The Westminster Shook Mill, Lulu Island, New Westminster, B. C., is producing finished box material at the rate of 35,000 to 40,000 feet per day or about 1,000,000 feet per month. The bulk of this product is going to the East Indian market. The officials of this company are the same as those of the B. C. Manufacturing Co., though the two organizations are carried on as distinct operations. J. H. McDonald is the manager, R. L. Cluff president and P. J. McMurphy, secretary.

Your Protection—
Our Guarantee

THE KRAETZER-CURED LUMBER CO.

Stamped on
Every Piece

The Economy of the Obvious

When you buy gum that is stained you are buying in the dark.

This graded, but stained gum arrives at your factory and is worked up into your own particular product.

Then comes the reckoning

From your plant superintendent comes the report that of the last delivery of gum such and such an amount had to be discarded because of dote, some more because of check, and more, perhaps because of wormholes.

All this because neither you nor the grader could see the defects—defects covered by the stain.

The Obvious Gum

When you buy KRAETZER-CURED GUM you know what you are getting. Each piece is bright and clean, and free from stain.

All stained gum is dotty or rotten in the interior of the piece—much of it so badly as to entirely unfit it for use.

Can your scratch-pad figures prove any real economy in buying stained and incorrectly graded gum when clean and correctly graded KRAETZER-CURED GUM can be purchased at a great eventual economy?

Write or wire to us for quotations.

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

Our Quartered and Plain Red and White Oak, Ask, Hickory, Red Gum and Tupelo is as fine as the highest quality of virgin timber and thorough knowledge of production can produce.

THERE IS NONE BETTER

A. E. Clark Outlines Hardwood Situation

Shows Definite Signs of Improvement --Lumber Likely Scarce Item During Next Year —Lumber Users as Well as Manufacturers Should Strive to Maintain Stabilized Hardwood Market

By A. E. Clark, address before Wholesale Lumber Dealers' Association

A discussion of the hardwood lumber situation of to-day is one upon which I hesitate to enter since it is fraught with so many of the elements of contradiction, according to the man's viewpoint. I can truly say, however, that the dealer and manufacturer of hardwood lumber has never at any time during the past year had any complaint to enter from the fact that the situation was at any time without variety. The season of 1920 was one in which hardwood soared to heights untold, but great has been the fall thereof.

In reviewing present-day conditions, one must necessarily refer back to the past years. What we referred to during the two years preceding the immediate past one as our boom years may now also be referred to as our boomerang years. 1919-1920 trade years were such that prices soared to extremes and were nothing more or less than pure gambles in many instances, and while this is true, I do not think the lumberman is unduly to blame. During the war the lumber manufacturers worked out to full capacity, and even then could not fulfil the needs of the country. After a month or two of sagging market at the close of the war, we again experienced a boom in all trades. Prices of production continued to ascend with consequent increases in lumber prices.

The complexion of the hardwood market has during the recent few years changed materially, as the advent of the motor and truck trade had produced a market which called for from 50 to 60 per cent. of our total hardwood production. The extreme shortages of supply caused many consuming concerns to order double and triple their necessary supplies on the assumption that they would only get partial deliveries anyway. This, coupled with the buyers, bidding against one another for available stocks, permitted of a gamblers' market, in which prices got to almost anything asked. However, this did not spell all profit for the lumberman, for what was true in lumber sales department was also true in machinery, food supplies and labor, and costs of production reached the breaking point.

Danger Signals Should Have Gone Up

Early in1920 signs were many that conditions were changing and danger signals should have been hoisted. Unfortunately we, as lumbermen, had large orders booked into the future and failed to read these danger signals or halt until our customers began asking for delayed shipments, and finally for cancellations. It is not necessary for me to tell you what the result of this over-purchasing and consequent cancellation of orders has been. The past year, during which most of the trade were carrying lumber produced at the extreme cost or purchased at extreme price, has told its own story. As we have endeavored to move this high-priced stock, we realize how thoroughly all branches of trade and manufacturing have been demoralized.

The past few months have begun to show some considerable signs of improvement, and we now find consuming trade realizing that they must shortly purchase stock if they are to continue operation of their factories. The purchasing is not going on in great volume, as the uncertainties of the situation, or as we sometimes feel inclined to say, the failures of the purchaser to recognize bargains when offered to him have retarded large purchasing. In general, I think the manufacturers and wholesalers have absorbed and written off the loses incumbent on previous high costs and speculation. The situation still presents its difficulties through the failure of some branches of industry to recognize its share in the absorption of losses and reductions to restore the wheels of industry.

Viewing conditions first from the pessimist's side, consideration must be given to a few prominent features. The Western situation is not as healthy as we should wish, through the fact that the farmers' products are at a very low point. This is reflected to us through the slackness in the implement trade. Building has not yet gotten back on its proper plane, due, Ishould say, in part to the refusal of some of the supply concerns to accept reduced prices, but due largely to the attitude of labor, more particularly in large centres.

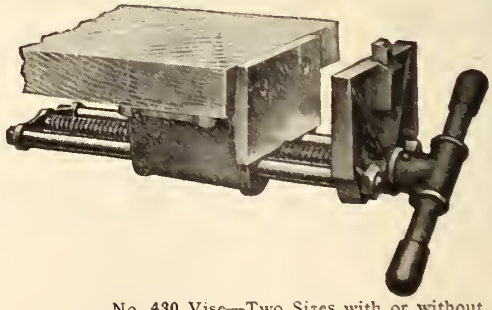
Must Be Prepared to Accept Reductions

To my mind the restoration of trade activities to a normal basis requires the sacrifice of all peoples. We must all be prepared to accept the reductions whether they be reductions in profits or reductions in wages. We must also be prepared to put our full energy into our enterprises again. There's nothing the matter with business, but there does seem to be something the matter with ourselves in our relation to business. Business will not go without "pep" and restore the confidence in order to start the motion.

During the past few weeks I have called on a large number of our cutsomers of hardwood lumber, and there is no question but that the situation has undergone great improvement. The furniture business, piano business and automobile business are better. Railways are doing more buying. Building has improved and has in some sections developed to almost a boom. The consuming trade have reduced their hardwood stocks and are not over-supplied. The flooring plants and box plants are gradually absorbing the over-supplies of low-grade hardwood.

(Continued on page 100)

Quick as a Cat - A Hold like a Bull Dog



No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

No. 430 Vise—Two Sizes with or without stop
UNEQUALLED FOR STRENGTH AND DURABILITY
Our Complete Catalogue on Request
RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.

Have You Met This Year's Lumber Needs?

The turn of the year has developed a more cleancut picture of hardwood supplies. In the matter of production natural causes are now fully in force in retarding output. What natural causes will not accomplish will be insisted upon by the bankers. Production is definitely prescribed and can not be expanded before spring.

Consumption shows improvement, developing increasing call on already much overstrained stocks. Anderson-Tully's Seventy Million Feet of annual Hardwood Production and the varied nature of its operation have fortunately made it possible to keep our stocks well rounded out. This stock runs in quartered and plain oak, gum and other Southern woods in lumber and veneers and is sold under our consistent high standards of quality and services.

We shall be pleased to help any buyer cover his season's needs.

Anderson-Tully Company

Memphis, Tenn.

ATCo MEMPHIS SOUTHERN HARDWOOD LUMBER & VENEER

Prospertiy is Coming

(Continued from page 49)

Building Material Costs

In May 1920 the wholesale price of 48 building materials reached a peak price of 184 per cent above 1913, whereas the average for the year was 165 per cent above the pre-war. In December, 1921, material costs had receded to a point 93 per cent above 1913, or about 50 per cent below the peak.

While prices are still much above pre-war levels, the decline from the peak has been fairly radical. During the past building year they have remained relatively stable and with the prospect of general business activity increasing, the probabilities are that they will go but little below present levels until the edge is taken off demand by a year of fairly active building.

Building activity has been greatest in those sections wherein wages have liquidated most or where some other contributing factor has made building more attractive, relatively than in other sections. We expect this movement already underway in some sections, to spread rather generally, and believe that by next spring, the level of such wages will be considerably reduced. The present scale of building wages for the country as a whole is less than 10 per cent below the peak of 1920. There is no doubt at all that this condition has contributed most largely towards deferring activity, This year a real effort should be made to provide work for the building trades as soon as winter breaks. During recent years there has been so much jockeying over wages and hours of labor that several weeks or months of good spring weather have been lost. Let us hope that employers and employees will come to an agreement this year before the end of March.

The Outlook for 1922

All told we think that 1922 should see a substantial increase in general building activity. The country has passed through the worst stages of depression, and is now on the upgrade. Indications are multiplying that general industry is advancing slowly but surely. The fact that construction activity is holding up at an unusually high level through the winter months, taken with other known factors that are likely to effect the rate of activity next year, gives promise to an unusually good year for construction in 1922.

With the progress of credit liquidation and the rise in bond prices, and the lower cost of building, mortgage money will probably be in easier supply and at lower rates, and there is a fair probability of lower freight rates in building materials. While over the longer trend it is almost certain that a year or two of active building will bring construction values downward, the present unfilled need indicates no such trend for 1922.

The present prospect is that spring will furnish an unusual opportunity for profit to the builder. Interest rates, wages, and material prices will all presumably be relatively low. Both 1922 and 1923 will probably be years of more than normal building activity, but the prospects are that the man who builds this year will stand a much better chance of making a profitable return than will the man who postpones construction work until 1923.

1921 was a year of liquidation. 1922 will be a year of recuperation. We are not in a period of "hard times coming." We are in a period of "soft times going." Prosperity is coming—it's time to go out and meet it.

Kiln Drying Course for Home Study

Since the announcement of the correspondence-study course, Kiln Drying of Lumber, by the Extension Division of the University of Wisconsin less than two years ago, almost 400 persons have enrolled. This course has been developed through co-operation of the U. S. Forest Products Laboratory. Men from 37 States of the Union and seven foreign countries have taken up this mail instruction to learn more about the art of operating dry kilns, and the proper handling of lumber in general.

The distribution of the students according to states reflects fairly well the location of the lumbering and wood-using industries. The registration runs as follows. Indiana, 39; Wisconsin, 37; Michigan, 35; California, 23; Illinois, 19; New York, 18; Pennsylvania, 13; Missouri, 12; Washington, 12; Louisiana, 11; Kentucky, 10; and all other states, 109. The registration from foreign countries includes 16 from Canada, and one each from Mexico, Panama, Porto Rico, England, China, and New Zealand.

This correspondence-study course is an outgrowth of the resident short courses which have proved so successful at the U. S. Forest Products Laboratory, located on the university campus. It was early recognized that much of the information on improved methods of kiln drying could be taught by mail. Many men who cannot avail themselves of the class instruction in Kiln Drying given at regular intervals at Madison enroll for the correspondence-study course and so obtain valuable information upon the latest developments in the seasoning of wood.

The text used in this course is specially prepared and in such a form that it can readily be understood by any one with only a common school education. Many of those who have successfully taken the course had not finished the common school grades. Others have had more education, while a considerable number have been college gradnates. But the way the work is organized, the value of the course can be easily fitted to the needs of the individual, and each one with the co-operation of the instructor builds up a series of papers that when completed make a volume of information exactly suited to each individual.

The Extension Division of the University of Wisconsin, Madison, will gladly supply information on request.

C. A. Spencer, Limited

: Members National Hardwood Lumber Association ::

Merchants
and
Manufacturers
of

CANADIAN HARDWOODS

Good Stocks Right Grades
Prompt Shipments

Crating of all descriptions

McGILL BUILDING - MONTREAL

African Mahogany

JUST ARRIVED

Choice shipment showing good percentage of Roey Figure. F. A. S. quality, firm texture.

West African Mahogany

This is the first direct shipment we have been able to receive since pre-war days.

Our supply is limited, don't miss some of it.

Phone, Adelaide 148

The Gall Lumber Co., Ltd.

Offices, Dry Kilns & Sorting Yards — Toronto

Illustration:

The supply of good dry Hardwoods is tapering off

V

Λ

The volume of urgent shipments is broadening out

Reasoning:

Action and re-action are equal.

Question:

Do you buy at the bottom?

Answer:

?

We solicit your reply.

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 203 McGill Bldg.

Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

A. E. Clark Outlines Hardwood Situation

(Continued from page 96)

As reports come in, I can see a marked improvement in the export situation. I should say that the situation to-day is, that while our available supplies of dry hardwood look to be large, that is only when viewed from the blue ruin glasses we have worn for the last few months. Trade conditions are better and are improving, and the only over supplies of hardwood are the low grade. The crying need of the world is building, and this need has reached the point where it cannot be denied; therefore, your low-grade surpluses will not trouble you long.

Lumber Shortage During 1922?

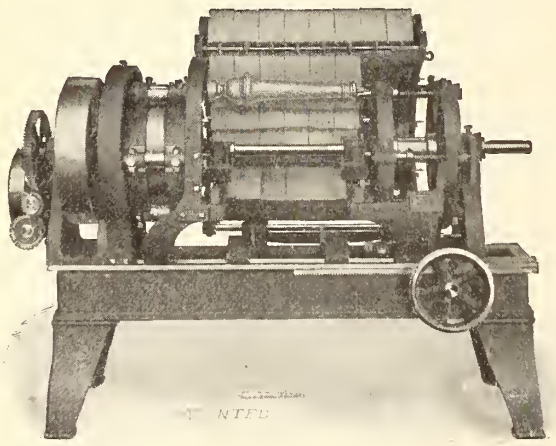
But, gentlemen, let us profit by the bitter experience of the past. We do not want a runaway market again. I have no doubt in my own mind that 1922 will show up a marked shortage of supply in practically all kinds of hardwood in the grade of No. 1 common and better. Production in U. S. and Canada during 1921 has been much below normal. The proposed production this winter, both in the north and south, is low, most people placing it at around 25 per cent. of normal. This small output is due almost in its entirety to the fact that prices of hardwood to-day are so low that the producer cannot get a profit. Now, the cure is a reasonable increase in prices, and I feel sure it is coming. I think our danger lies therein. If we get a reasonable increase in prices consumers will not be in any way injured, but if we permit the impending shortage to create a runaway market again, it must do harm.

A feature that has influenced the hardwood markets and retarded recovery has been the excessive freights now in effect. Hardwood transported on a per hundred basis and being a heavy material, suffers probably more serious than the other lumber lines. The local rate situations tend to discourage consumption of Canadian lumber and benefit the southern product through the unfair rate basis by which local rates are all out of line with through southern rates. This rate question, too, is discouraging more particularly in the sale of low grades, as it seems ridiculous to pay $180 for a car of low-grade lumber and $200 for freight. The sooner the railway companies recognize they are killing business, and restore rates prior to the 40 per cent. increase, and then automatically reduce the wages of their overpaid employees, the sooner will good business result.

Resaonable Profit and Stabilized Situation

I should sum up the hardwood condition by stating that, unless some unforeseen feature enters into our present situation, the man who holds hardwood lumber to-day should consider he has an asset which in the very near future the consuming trade will recognize the value of. At present his product is being sold at even less than the present day cost of reproduction. He is justified in holding for cost plus a reasonable profit. The man who knows his business can prove his position in this matter. Consumers will recognize this argument, but they will also recognize any attempt to create another runaway. Let us endeavor to get a reasonable profit and a stabilized market.

DO YOU KNOW



what it is costing you to sand your furniture and chair turnings by hand rather than on a Nash Sander?

If you don't it is high time you gave this matter serious thought.

Now is a good time to look into this.

J. M. NASH, Milwaukee, Wis.

A Friendly Talk on Co-operation

The following chat by a large manufacturer of hardwood lumber should carry conviction for instead of urging woodusers to buy, it suggests caution and conservativeness in making lumber purchases:

Lumber prices have advanced. Some further advances in the lower grades are necessary in order to bring the average log run price to a basis that will justify production. But don't let's go too far.

The influence of the vast amount of distress stock during recent months discouraged production. Stocks of the higher grades are exceedingly light; and there is no chance to increase production now, as the season for logging has passed. The stage setting is identical with 1919, but let's keep our heads—surely experience makes men wiser.

Unwarranted inflation of prices is inevitably followed by a decline to levels that do not return the cost of production. The first is burdensome on you, the second is ruinous to us. Let's co-operate to stabilize prices, to eliminate violent fluctuations.

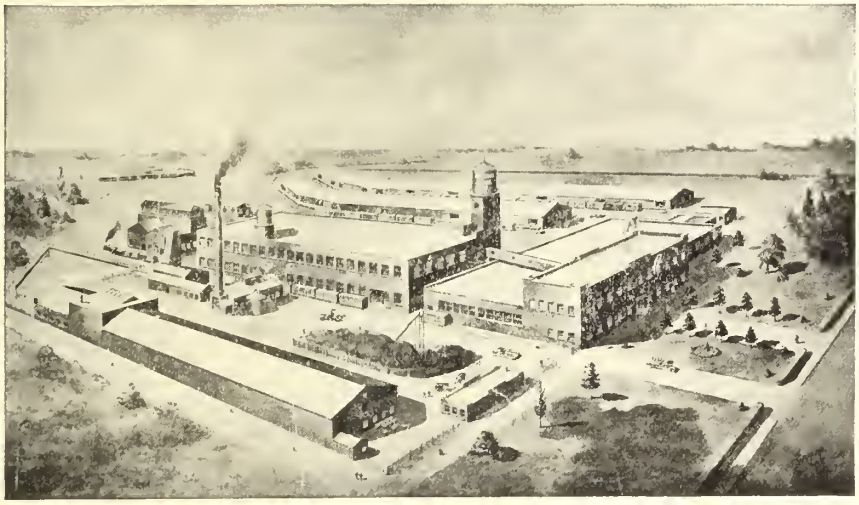
Our duties are clear. Ours is to manufacture as much lumber as we can in order to make up the shortage. Yours is to refrain from speculation. Buy all the lumber you need and figure on a reasonable margin of safety, but don't take from the present limited supply, lumber that you will not require for a long time to come.

We are moving forward to better things, but let's move sanely, apply the lessons we have learned, and co-operate as we march along.

Good workmen use safe tools. Defective tools are fit only for the scrap heap. Use only tools that are in good condition and on work for which they are designed.

Perkins Vegetable Glue

is applied cold and will not congeal in cold weather—
a fact to bear in mind at this season of the year.



The Picture Shows The Present Home of

PERKINS 183

TRADE MARK (Reg. U.S. Pat. Off.)

Build up to a Quality Not Down to a Price

Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office:
South Bend, Indiana

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Band Resaw, Connell & Dengler, 54 and 60".
Band Rip Saw, Yates No. 281
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 44 in. heavy type.
Dowel Machine, Hayes
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.
Jointer, Falls Machine Co., undercut 24 in.,
Jointers, 12", 16" and 24"
Jointer, Diehl Continuuous Feed
Lathe, Back Knife Clement 40 in.
Moulder, Hermance 8 and 10 in., 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 4" and 10", 4 side
Matcher, American No. 229 fast feed hardwood flooring.
Planers, all sizes, single and double
Sander, endless bed 48 in., H. B. Smith.
Sander, Moore Machine Co., belt.
Sanders, Columbia 42", 48" and 60"
Saw, mitre, double end Maddox.

Woodworking Machinery Company of Buffalo, 54 Mechanic St., Buffalo, N.Y.
1 T.f.

FOR SALE

Bargains

24" Double Surface Planer and Marcher,
16" Buzz Planer, safety cylinder,
Box Board Matcher, Mereen-Johnson,
24" Surface Planer, good as new,
Two Spindle Shaper,
Band Saws, 26", 30" and 34" wheels,
Variety Saw,
Fox Trimmer,
42" Three Drum Sander,

Cowan & Company of Galt Limited, Galt, Ontario. 1

WANTED

First class foreman finisher. One thoroughly competent to produce the best finishes, including all special finishes. State experience and wages required. Apply Box 119—The Canadian Woodworker, Toronto. 12-1

FOR SALE

Nearly new No. 162 Preston heavy high speed shaper, with special jointing fences and safety hoods, ball bearing Pulley, Smith Brothers, 606 Jane St., West Toronto. 1

FOR SALE

One large size Billstrom Clamping Machine
One Mattison Turning Machine with equipment
One Moore 6' Power Stroke Panel Sander
One Houston 8 x 4-4 sided moulder, complete
One Belt Power Driven Veneer Press 36 x 54"
One Fay Egan Chain Feed Rip Saw (Lightning)
Various sizes three drum Royal Invincible Sanders

These Machines are all guaranteed in first class condition. Victor J. Reed Esq., Jamestown, Ohio. 1

POSITION WANTED

Can you use the services of a young married man, 35 years of age who has been on the executive of a large woodenware manufacturing concern for the past ten years. Has plenty of initiative and would consider salary as secondary consideration if given an opportunity to grow up with an established concern. Excellent references. Box 123 Canadian Woodworker, Toronto. 1

WANTED

Thoroughly experienced Hardwood Lumber salesman. Give full particulars in first letter as to territory travelled and want to travel, experience and who worked for, references, salary expected, and when can start. Box 122 Canadian Woodworker, Toronto, Canada. 1

POSITION VACANT

Salesman desired, with established trade, to handle on commission in Canada a complete line of Reed Chairs and Furniture, and Children's Reed Carriages. Address Box 124 Canadian Woodworker, Toronto, Canada. 1-2

FOREMAN WANTED—for Sash, Door and General Woodworking Factory in Eastern Canada. Man wanted must be able to speak both French and English, must be first class mechanic, understand thoroughly woodworking machinery and be able to lay out his work. Steady position for the right man. State clearly first letter, experience, whom worked for, age, married or single, wages required, and when ready for work if application is accepted. Apply Box 121 Canadian Woodworker Toronto. 1

LEAD MINING IN SWATOW DISTRICT

The Chuling Mining Works, which is working a lead mine in Chenping district, China, recently made its first shipment of lead. Smelting by native methods is carried on at the mine, the present capacity of the furnaces being 3 short tons per day. It is proposed to double this furnace capacity at an early date. A high-grade soft lead, running between 99.97 and 99.98 per cent. pure, is produced. It is shipped in slabs weighing 140 catties (about 185 pounds) each. About 115 short tons have already been exported. A ready market for this product is found in South China.

ELECTRIC RAILWAY CONSTRUCTION IN NORWAY

Information from Christiania states that the Norwegian Storthing has granted a concession to A/S Akersbanerne for the construction of an electric railway from the centre of Christiania to Ostensjo, a distance of about 8 kilometers. Work on the line will be commenced simultaneously with the construction of the Majorsteun-Sognsvandet railway, a concession for which was also granted recently.

A/S Kristiania Elektriske Sporvei (Electric Tramway Co.) will soon begin construction on the extension of its Lilleaker line to Stabaek. This work will cover a distance of about 4 kilometers.

ASPHALT FOR ROAD-MAKING IN AUSTRALIA

It is likely that asphalt roads will be used in Australia to a greater extent in the future, owing to the increasing cost of wooden blocks and the difficulty in obtaining them. Pending the purchase of an asphalt plant by the City Council of Melbourne, it has been recommended that the penetration method of binding macadam by bituminous material be adopted in some of the light-traffic streets of the city.

INCREASE COPPER PLANT

Chile Copper Co. plans for an increase in plant capacity from 15,000 tons to 35,000 tons a day as soon as conditions warrant. This should give the company a capacity for producing 300,000,000 pounds of copper annually, and on the basis of the 1920 cost of producing little more than one-third of this amount, it is estimated that Chile should then turn out its copper for 8 cents a pound, if not lower.

GREEK COAL IMPORTS

At present from 250,000 to 300,000 tons of coal are annual imported into Greece. In 1920 about 212,000 tons were imported, of which 50 per cent. came from the United States, 45 per cent. from England, and 5 per cent. from other countries. According to statistics received from official sources, up to August 31 of this year England sent 80,615 tons and the United States 41,890.

DARNELL-LOVE LUMBER COMPANY

MANUFACTURERS AND EXPORTERS

HARDWOOD LUMBER

LELAND, MISS.
U.S.A.

F T. TURNER, President
H D. LOVE, Vice-Pres't
F G WOODS, Secretary
R W RICKETTS, Treasurer

CABLE ADDRESS
"DARLOVE"

TWO BAND MILLS

CODES USED
UNIVERSAL
A.B.C 5TH EDITION IMPROVED
WESTERN UNION

The following is a list of unsold lumber n our Yards, nearly all of which is dry and available for prompt shipment. We solicit your inquiries and orders.

QUARTERED WHITE OAK

25,000 5/8 FAS
17,000 3/4 FAS
175,000 5/8 No. 1 C&S.
60,000 3/4 No. 1 C&S.
55,000 4/4 No. 1 C&S. Strips 2½ 5½"
20,000 5/8 No. 2 Com.
60,000 3/4 No. 2 Com.

PLAIN WHITE OAK

8,000 1/2 FAS
90,000 3/8 No. 1 C&S
25,000 5/8 No. 1 C&S.
45,000 1/2 No. 2 Com.
25,000 5/8 No. 2 Com.
12,000 3/4 No. 2 Com.
8,000 4" Crossing Plank

PLAIN RED OAK

6,000 3/8 FAS
50,000 1/2 FAS
25,000 3/4 FAS
20,000 5/8 12" Wdr. Coffin Bds.
15,000 4/4 12 to 15" " "
35,000 1/2 No. 1 C&S
25,000 5/8 No. 1 C&S
175,000 3/4 No. 1 C&S.
85,000 1/2 No. 2 Com.
125,000 3/4 No. 2 Com.
250,000 5/8 No. 3 Com.
200,000 3/4 No. 3 Com.

PLAIN BLACK GUM

8,000 4/4 FAS
7,500 4/4 No. 1 C&S
3,000 4/4 No. 2 Com.

QUARTERED BLACK GUM

20,000 4/4 Log Run

ASH

30,000 1/2 FAS
3,000 5/4 Com. & Better
4,000 6/4 Com. & Better
50,000 12/4 No. 2 C. & Better
4,000 3/8 No. 1 C&S.
70,000 1/2 No. 1 C&S.
25,000 4/4 No. 2 Com.
8,000 12/4 No. 2 Com.
35,000 4/4 No. 3 Com.
6,500 12/4 No. 3 Com.

HACKBERRY

1,200 4/4 Log Run
7,500 5/4 Log Run
3,000 5/4 No. 3 Common

PLAIN RED GUM

28,000 3/8 No. 1 C&S
17,000 5/8 No. 1 C&S
17,000 3/4 No. 1 C&S

QUARTERED RED GUM

20,000 5/8 FAS
5,000 3/4 FAS
30,000 5/4 FAS
8,000 6/4 FAS
75,000 8/4 FAS
30,000 5/8 No. 1 C&S.
175,000 3/4 No. 1 C&S.
12,000 4/4 No. 1 C&S.
24,000 5/4 No. 1 C&S.
10,000 6/4 No. 1 C&S.
120,000 8/4 No. 1 C&S.

PLAINSAP GUM

30,000 4/4 FAS 6/12"
30,000 5/8 FAS 10/13
85,000 5/8 FAS 14/15
50,000 5/8 FAS 13/17
45,000 4/4 FAS 14/15
30,000 4/4 16/19
45,000 4/4 18/21
30,000 4/4 20 & Up
14,000 4/4 Box Bds. 9/12
65,000 4/4 Box Bds. 13/17
26,000 3/8 No. 1 C&S.
50,000 5/8 "
20,000 3/4 "
15,000 4/4 "
25,000 3/4 No. 2 Com.
50,000 8/4 No. 2 Com.

QUARTERED RED GUM

Sap No Defect

20,000 5/8 FAS
45,000 3/4 "
30,000 5/4 "
75,000 6/4 "
24,000 8/4 "
15,000 3/4 No. 1 C&S.
15,000 4/4 "
30,000 5/4 "
75,000 6/4 "
15,000 8/4 "

COTTONWOOD

60,000 4/4 FAS 6/12"
15,000 4/4 FAS 13/17
35,000 4/4 No. 1 C&S.
15,000 4/4 No. 2 Com.

PANTHERBURN CYPRESS

15,000 8/4 FAS 4/12"
45,000 10/4 " "
40,000 12/4 " 13/17
26,000 12/4 " 18 & UP
45,000 4/4 Select
75,000 6/4 "
15,000 8/4 "
150,000 4/4 No. 1 Shop
75,000 6/4 No. 1 "
50,000 8/4 No. 1 "
70,000 1/2 No. 2 Common
45,000 1 x 6 No. 2 Common
35,000 1 x 8 No. 2 "
30,000 1 x 10 No. 2 "
45,000 1 x 12 No. 2 "
50,000 6/4 No. 2 Common
15,000 8/4 No. 2 Common
250,000 1 x 4 & Up Boxing
35,000 1 x 6 "
30,000 1 x 8 "
60,000 1 x 12 "
28,000 6/4 "
100,000 4/4 Peck
15,000 1 x 8 "
30,000 1 x 10 "
15,000 1 x 12 "

ELM

30,000 4/4 12" & Wdr. Coffin Bds
30,000 4/4 Log Run
42,000 10/4 No. 2 Common
15,000 12/4 No. 2 Common
40,000 3/4 No. 3 Common

MAPLE

300 4/4 Log Run
6,000 6/4 " "
7,000 10/4 " "
400 12/4 " "

PLAIN SYCAMORE

8,500 4/4 Log Run

PANTHERBURN CYPRESS SHINGLES

22,750 4" BEST
98,000 5 "
12,250 6 "
15,500 4 PRIME
36,750 5 "
14,000 6 "
37,000 4 ECONOMY
83,000 5 "
23,000 6 "

It is understood that our stocks are constantly changing by reason of manufacture and shipment. We are prepared to surface one or two sides.

Our Sales Representative in the Chicago and Michigan Territories is the

LELAND STAVE & LUMBER COMPANY

HOME OFFICE LELAND, MISSISSIPPI

MANUFACTURERS AND WHOLESALERS

LELAND, MISS.
U.S.A.

F T TURNER President
C E ROBBS, Vice President
F G WOODS, Secretary
H D LOVE, Treasurer
W.F. LITTLE, General Manager

CHICAGO OFFICE
1039 MARQUETTE BUILDING
PHONE RANDOLPH 7957

C.W PARHAM, Manager

Made in Canada.

The Sidman Lumber Curing Process

—IN—

Remodeled or new Wood, Brick or Concrete Buildings.

Automatic Heating and Ventilating Systems for Varnish Rooms.

Three-ply and Du-o-fold Army Duck Curtains.

Automatic Suction Systems, for returning all condensation **direct** to the boiler.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-down Draught Vent Heads for all purposes.

Cleanable Screen Window and Panel Ventilators.

Roller Bearing **Channel** Iron Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and the Sidman **Special** Hygrometers.

For Description and Prices, write

The Sidmans of Canada

Heating and Ventilating Engineers
***and* Lumber Curing Specialists.**

LONDON **ONTARIO**

Made in Canada.

The Mother of Invention

Another interesting instance of evolution in manufacture is Fibro-Kane Patented Reeds and Webbings. Starting over twenty years ago when reeds and rattans were very scarce by reason of government disturbances at Singapore, with a mediocre substitute for flat reeds, when rattan again became available those who had been using this substitute went back to the genuine article. The manufacturer of fibre however had had emplanted in his mind a very fertile seed. Continual experiment resulted in Fibro-Kane being patented shortly before the war.

At that time genuine rattan was available in large quantities at low prices. Furniture manufacturers, as with all of us, took the line of least resistance. Those who could appreciate the superior qualities of the new article could se better the fact that rattan had been used, was being used and seemed to answer the purpose. Besides they would have to educate their help to use it. Labor did not like new things. Then again their own salesmen would have to explain its virtues to the retailer and possibly the retailer to the onsumer. It seemed like too much trouble and as is often the case it looked as though the inventor was to have nothing for his labors.

Then war in 1914! Germany had been the world's largest splitters and was entirely cut off, resulting in a great shortage of all reed products. Furniture manufacturers scrambled over each other to buy meagre supplies. Prices soared. Specially chartered ships scurried here and there to bring raw rattan to the United States but even that which arrived could not all be split. Our help and our manufacturers were not experienced and did not have the machinery.

For a time it looked as though rattan products generally would be eliminated in the manufacture of furniture. Under the urgency of demand however the organization by which Fibro-Kane was manufactured, expanded, first caring for the baby carriage trade with flat, split and round reeds, then rapidly and successively into close woven webbing for the suit case and furniture factories, twill webbing for car seating and finally round open webbing in all width meshes. The little Fibro-Kane business like England's 'contemptible hundred thousand" had grown as needed and prevented a serious curtailment during the war which might have become permanent, of the use of all reed and rattan for manufacturing furniture.

However, so much for necessity. The education of everyone to the qualities of Fibro-Kane was not forgotten. To-day fibre furniture is one of the leading factors in the industry. From an article used from necessity it has become a product recognized as equal in all and superior in many respects to genuine cane by most of the nearly one thousand furniture manufacturers to whom it has been furnished.

Dates For Kiln Drying Courses

The Forest Products Laboratory announces that with the giving of dry kiln courses in the west, only two courses will be offered at Madison, Wisconsin during the next six months. The first will be held January 16-17, 1922, and the second June 5-16, 1922 Arrangements are under way to give several kiln drying courses in the lumbering centers of the pine, fir and redwood regions of the western states, where much interest is being exhibited in a kiln drying program.

HYDRAULIC VENEER PRESSES
AND
LUMBER ELEVATORS

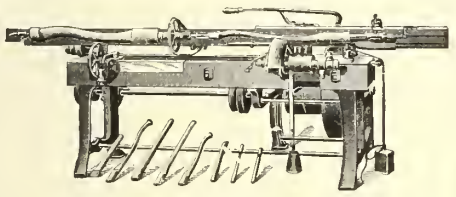
Write for Explanation of our Most Efficient Veneer Package Handling System

E. B. VAN ATTA & CO., INC.
OLEAN, N. Y.

New York City Office: 50 Church St. Chicago Representative: Fader Machinery Company, 549 Washington Boulevard

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

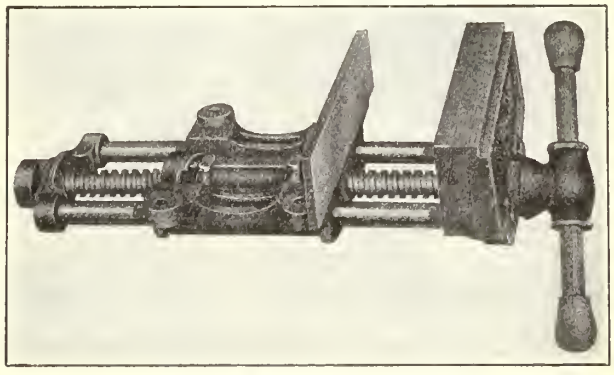
Lathes for turning Ax, Adz, Hammer, Hatchet, Pick, Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.

We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY
Klotz Machine Co.,
Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

The Vise You Swear BY not AT



On the Market for 15 years.

Globe Vise & Truck Co.
GRAND RAPIDS, MICH.

We also manufacture a complete line of steel trucks particularly for wood working factories. The body of our truck is absolutely indestructible, and there are no nails nor screws in the top to mar material, whether finished or unfinished. The roller bearing feature in the wheels allows for much easier handling than the old style plain wheels on the wood truck. In fact one man can handle much more material than on the old style. The price is very little more than that of the old style wood trucks.

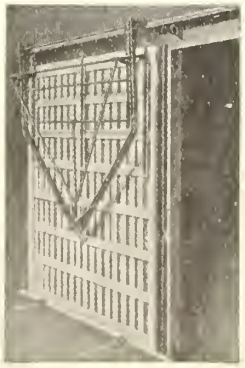
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd. Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A.

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

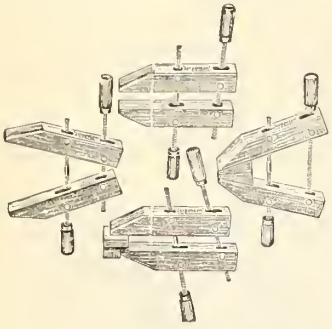
Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN
DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.



"Jorgensen"

Peerless Adjustable Hand Clamp

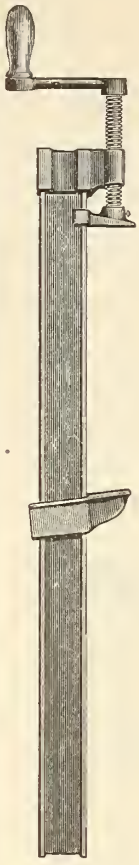
Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

For Sale By

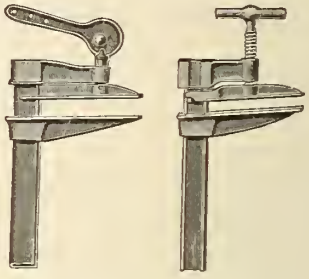
Aikenhead Hardware Limited ..... Toronto
Caverhill Learmont Co. ..... Montreal
Lewis Bros., Limited ..... Montreal



Colt's Clamps

for the

Woodworker



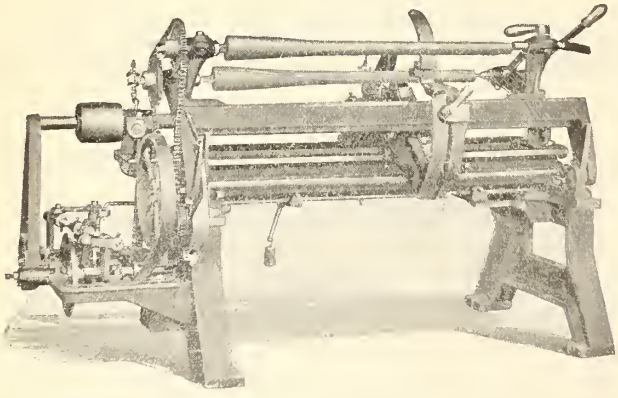
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



Wood Turning Machinery

for making Handles, Spokes, Ball-Bats, Spindles, Table Legs, Chair Legs, Whiffletrees, Neck Yokes, Etc.

ALSO SANDERS, RIP SAWS, CUT OFF SAWS, ETC.

Our machines are
SIMPLE, STRONG, DURABLE

Write for free catalogue No. 31

THE OBER MFG. CO.

CHAGRIN FALLS. O., U.S.A.

Better work follows the use of the "Empire"

There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

Get in touch with us now. We can make prompt delivery from stock.

We specialize in all types of woodworking tools.

Empire Tool Works

Toronto - Ontario

OAKEY'S

Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

JOHN OAKEY & SONS LTD., WELLINGTON EMERY AND BLACK LEAD MILLS LONDON, S. E. 1.

Canadian Agents:

F. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

THE SLIDE IS THE HEART OF YOUR EXTENSION TABLE

If the Slide Does Not Work properly Your Whole Table is Condemned

Wabash Slides insure **Satisfied Customers**

SLIDE MAKING is a SPECIALTY BUSINESS

We can Furnish Better Slides for Less Cost

Eliminate Slide Troubles by using WABASH SLIDES

MADE BY

B. Walter & Company

Edsall St., Wabash, Ind.

"The Phillips Line"

Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

Atlas Mfg. Co. of Orlando

Orlando, Fla., U. S. A.

Dowels, Turnings, Knobs, Spindles, Buttons, Drawer Stops, Table Pins, Screwhole Plugs. Special Woodwork to order.

No 2 Dowel Pin

HENRY ROWE MFG. COMPANY NEWAYGO, Mich.

NAILS AND WIRE

For Every Need in the Woodworking Industry

Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

Laidlaw Bale-Tie Co., Ltd.

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

S.E.OVERTON CO.
"Our Quality Is Always Higher Than Our Price"
ARTISTIC WOOD CARVINGS

WE specialize in the manufacture of high grade wood carvings, wood turnings and specialties.

Our highly skilled organization and improved equipment permit us to produce highly finished carvings in any quantity, promptly and economically.

Our prices are satisfactory—write for them.

S. E.
OVERTON
COMPANY
SOUTH HAVEN
MICHIGAN U. S. A.

COIGNET
FRENCH
GLUES

Make the Strongest and Most Durable Joints

Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

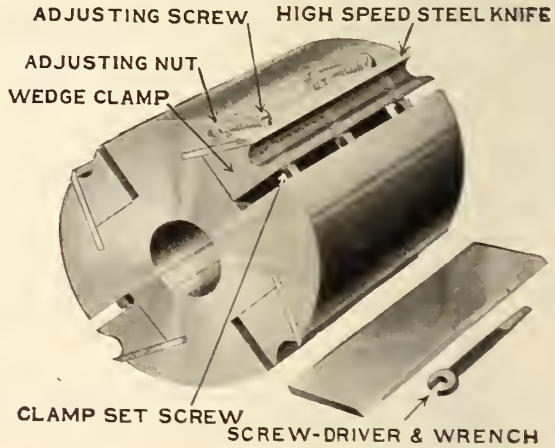
Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY
17 State Street NEW YORK CITY

NEW and USED
Ironworking — Woodworking
MACHINERY
AND
SUPPLIES

ASK FOR OUR NEW STOCK LIST

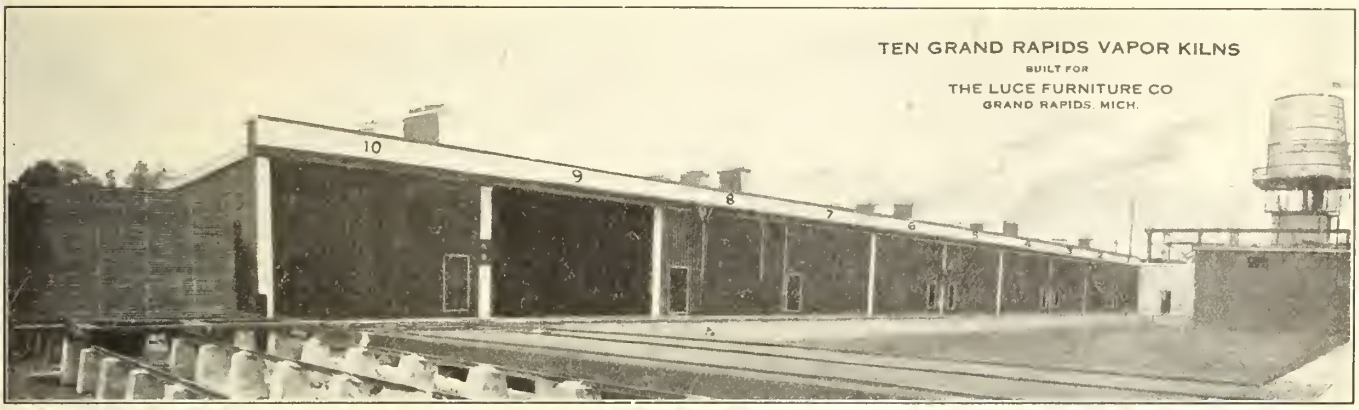
H. W. Petrie, Limited
131—147 Front Street West
Toronto

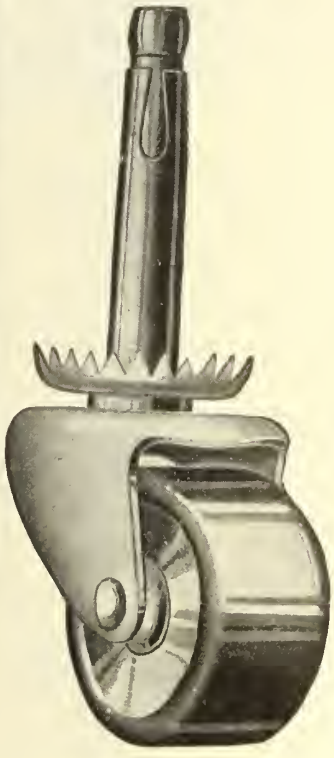


The PORTER "C" Slip-on-Head for Shapers, Jointers and Moulders will cut straight or cross grain without tearing. Irregular shaped knives can be used as well.

There are over 3,000 of these Heads in daily use.
Write for circular and quotation.

C. O. Porter Machinery Co.
GRAND RAPIDS, MICHIGAN, U.S.A.





Casters and Hardware

National Casters are made in an up-to-date plant in Canada by Canadian workmen—the men who buy your furniture. When you purchase the products of their labor, you in turn enable them to purchase yours.

National Casters are made from the finest materials and the workmanship and finish are first class.

Prices are attractive and deliveries prompt. May we send you full particulars?

National Hardware Co., Limited
Orillia - Ontario

The Peter Hay Knife Co., Ltd.

Manufacture the Best
PLANER KNIVES
and CUTTERS
OF ALL DESCRIPTIONS
The Peter Hay Knife Co., Limited
GALT, ONTARIO

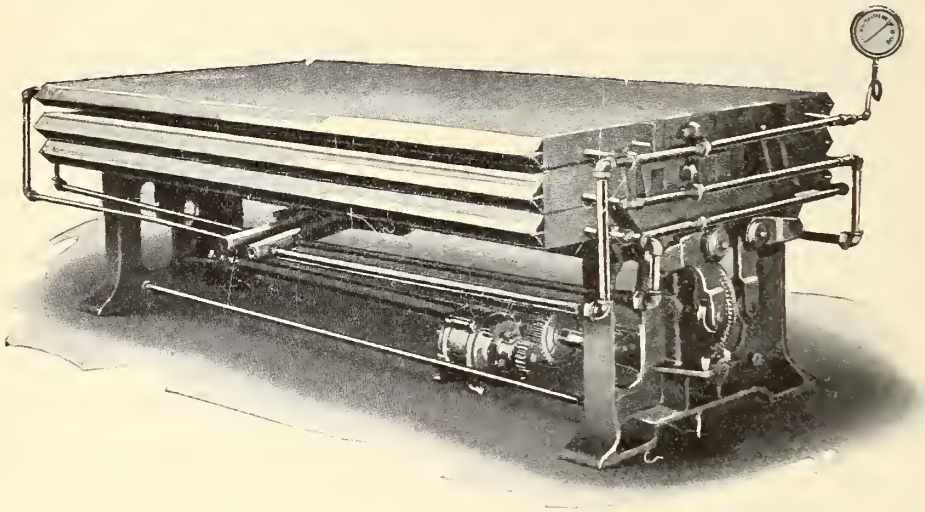
PRESSES

For Veneer and Veneer Drying
Made in Canada

William R. Perrin
Limited
Toronto

THE CHICAGO MIRROR
AND
ART GLASS COMPANY
Manufacturers
of
RELIABLE MIRRORS
AND
PLATE GLASS TOPS
Send your specifications
to us at
216 NO. CLINTON ST., CHICAGO, ILL.

Calhoun Plywood Company
Panels Tops Counter Fronts
OPERA CHAIRS
in the White or finished.
Vegetable or Waterproof
Glue.
Sheboygan - Wisconsin



The "Merit" Three-Plate Veneer Re-Drier
has two openings only and is designed for plants having need of a re-drier of moderate cost and of limited capacity.

The machine is electrically driven and is piped for connection with the factory steam line.

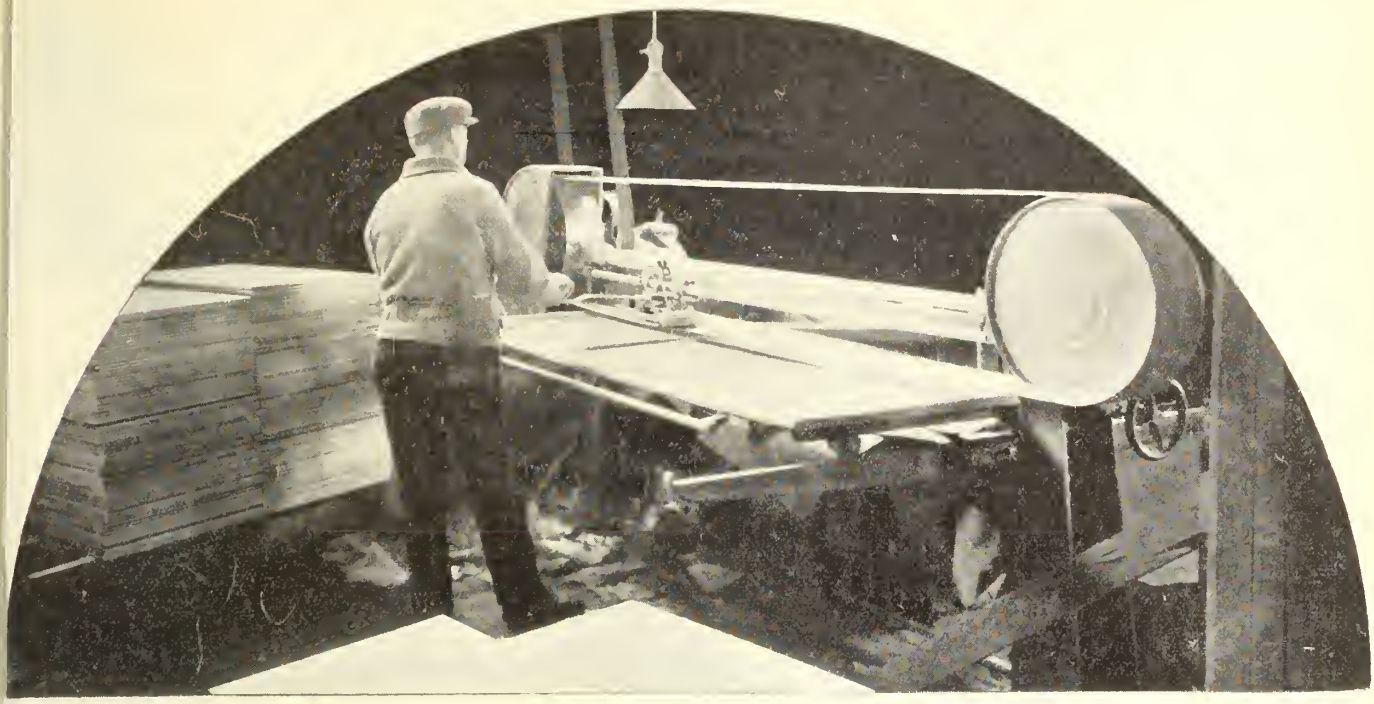
A vertical movement of the middle plate gives the veneer pressure first in one opening and then in the other and provides the well-known "Breathing Movement" peculiar to Merit Re-Driers.

MERRITT ENGINEERING & SALES COMPANY
LOCKPORT, N. Y.

MESCO
The "Merit"
Re-Drier
FOR VENEER
INSURE your veneer work against surface checks, hair lines, blisters, warping and glue failure by installing a "Merit" Re-drier..
Thoroughly dry and flat veneer avoids these troubles, gives tight joints and saves glue.
No system of air drying will accomplish this result. Hot Plates with "breathing movement" are the thing.
MERIT

The
"Steelgrip"
"Steelgrip"
METHOD IS THE BEST
for making mitered, butt or any other joint
Used by all leading Furniture, Cabinet and Casket Manufacturers.

In using *"Steelgrip"* CLAMP NAILS
only the ordinary machine work is required. Cut a slot, drive in a "Steelgrip," that's all. No clamping, no waiting for glue to set.
Avoid Substitutes
"Steelgrip" CLAMP NAILS
Save Time + Labor = Money
Produce, Strength + Durability = Better Product
Shipped in cartoons of 1 lb. 5 lbs. and 10 lbs. each. Bulk packages 25 lbs., 50 lbs. and 100 lbs. each
CLAMP NAIL COMPANY
4532 PALMER STREET, CHICAGO
CIRCULARS and SAMPLES ON REQUEST.



Now They Do a Better Job of Sanding Mahogany Veneers—

IT wasn't so very long ago that the men on the sanders in a certain plant began using Carborundum Brand Garnet Belts in No. 1 grit on sanding thousands of fine mahogany veneer panels.

They had been going on the theory that garnet belts were just garnet belts and that one make was about as good as another until—

They began using belts they cut from Carborundum Brand Garnet Cloth.

Then it wasn't long before they realized that there was a difference. Now they have belts that cut speedier, cleaner, more uniformly—belts that are true and even, belts that produce more work—better work.

CARBORUNDUM BRAND GARNET PRODUCTS ALWAYS MAKE GOOD SANDERS BETTER SANDERS

The Carborundum Company, Niagara Falls, New York

New York ·· Chicago ·· Boston ·· Philadelphia ·· Cleveland ·· Detroit ·· Pittsburgh
Cincinnati ·· Milwaukee ·· Grand Rapids

The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co., Toledo, Ohio
Paasche Air Brush Co., Chicago, Ill.

AROMATIC RED CEDAR
Earthman Lumber Co., Murfreesboro, Tenn.

AUTOMATIC HOLE-CUTTING MACHINE
Virginia Wheel and Hole Sawing Machine Co., Roanoke, Va.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARINGS
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, Que
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P.B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

BELTING
Chicago Rawhide Mfg. Co., Toronto.
McLaren, Ltd., D. K., Montreal, Que.
Mechanical Leathers, Ltd., Toronto.

B. C. FOREST PRODUCTS
B. C. Lumber Commissioner, Toronto, Ont.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner Mass.
Williams Machinery Co., A. R., Toronto, Ont.

BLOWERS
Canadian Blower & Forge Co., Kitchener, Ont.

BLOW PIPING
Canadian Blower & Forge Co., Kitchener, Ont.
Neville Cooper Co., Toronto.

BOILERS
Engineering & Machine Works, St. Catharines, Ont.

BORING MACHINES
Canada Machinery Corporation, Galt, Ont
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Son Co., L. G., Gardner, Mass.
Nash, J. M., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Reynolds Machine Co., Massillon, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

BUTTONS
Rowe Mfg. Co., Newaygo, Mich.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.

CASTERS
Foster, Merriam Co., Meriden, Conn.
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C., Indianapolis, Ind.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company, Preston, Ont.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

CLAMP CARRIERS
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.

CRATING LUMBER
Lloyd, W. Y., Toronto, Ont.
Colborn, C. B., Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D., Guelph, Ont.

CUT-OFF SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind
Richards-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont
Williams Machinery Co., A. R., Toronto, Ont

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Williams Machinery Co., A. R., Toronto, Ont

DOWELS
Canada Wood Specialty Co., Ltd., Orillia, Ont
Rowe Mfg. Co., Newaygo, Mich.

DRIERS(Hot Plate)
Merritt Eng & Sales Co., Lockport, N.Y.

DRIERS (Veneer)
Merritt Eng & Sales Co., Lockport, N.Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont
Grand Rapids Veneer Works, Grand Rapids Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

EDGER SAWS
Atkins & Co., E. C., Hamilton, Ont.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont
Garlock Machinery Ltd., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.

FEED ROLLS
Atkins & Co., E. C., Hamilton, Ont.

FINISHING PRODUCTS
Campbell Co., M. L., Kansas City, Mo.

FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.
Mechanical Leathers, Ltd., Toronto.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y
Macdonald, Norman, Toronto, Ont.
Oakey & Sons, Limited, John, London, S.E.I (Wellington Emery & Black Lead Mills).

SKF

SELF-ALIGNING

BALL BEARINGS

WHEN bearing troubles crop up in your plant it is well to remember that problems just as difficult have been solved by SKF Engineers. It may have been in England, France, Japan or United States—but the knowledge and experience that solved them are at YOUR Service here in Canada—free of cost or obligation.

Consult SKF Engineers—they can end your bearing troubles.

CANADIAN SKF COMPANY, LIMITED

TORONTO - - MONTREAL

"Canadian Woodworker" Buyers' Directory—Continued

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GLUE
Coignet Chemical Products Co., New York N.Y.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
Aberdeen Lumber Co., Pittsburg, Pa.
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Darnell-Love Lumber Co., Leland, Miss.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Paepcke-Leicht Lumber Co., Chicago, Ill.
Rush Lumber Co., Memphis, Tenn.
Thomas & Proetz Lumber Co., St. Louis Mo.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE
Laidlaw Bale-Tie Co. Hamilton, Ont
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.

HARDWOOD DIMENSION STOCKS
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson, Shreiner & Mawson, Toronto, Ont.
Anderson-Tully Co., Memphis, Tenn.
Arkla Lumber & Mfg. Co., St. Thomas.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio.
Barlett Lumber Co., W. C., Charleston, Va.
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree Ark.
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Chicago Mill and Lumber Co., Chicago, Ill.
Darnell-Love Lumber Co., Leland, Miss.
Frye Lumber & Veneer Co., J. W., Dayton, O.
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La
Hafner Manufacturing Co., St. Louis, Mo.
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
London Lumber Co., London, Ont.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va
Mowhray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Paepcke Leicht Lumber Co., Chicago, Ill.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Pickrel Walnut Co., St. Louis, Mo
Richards Hardwood Co., Memphis, Tenn.
Rush Lumber Co., Memphis, Tenn.
Spencer, C. A., Montreal, Que.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn
Stimson & Co., J. V., Owensboro, Ky.
Tennessee Lumber & Coal Co., Cincinnati Ohio.
Thomas & Proetz Lumber Co., St. Louis Mo.
Vail Cooperage Co., Fort Wayne, Ind.
Whiting Co., Wm. S., Johnson City, Tenn.
Wisconsin Lumber Co., Chicago, Ill.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.
Van Atta & Co., E. B., Olean, N. Y.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochane & Company, Kitchener, Ont
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J.
Mechanical Leathers, Ltd., Toronto.

LEATHER (Upholstery Grains)
Mechanical Leathers Limited, Toronto.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.
Yates Machine Co., P.B. Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

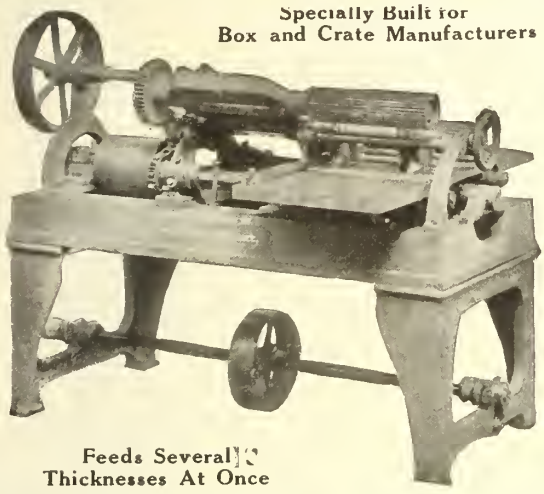
PANELS
Algoma Panel Co., Algoma, Wis.
Calhoun Plywood Co., Sheboygan, Wis.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

"The Chattanooga" — Just Another Name For Fast, Economical Gang Ripsawing

Specially Built for Box and Crate Manufacturers



Feeds Several Thicknesses At Once

This latest improved gang ripsaw is powerful, fast, safe and eliminates wastage. For gang sawing boards into strips or head sticks and for ripping veneers it is unsurpassed.

Has powerful feed and securely holds down and feeds short pieces. The feed rolls are automatically adjustable to varying thicknesses. Upper rolls are driven by cut gears, and the lower ones by sprocket chain. Several thicknesses of veneering can be fed thru machine at one time.

The CHATTANOOGA is an unusually big producer, easily operated, and turns to profitable account short stuff lying around a mill—otherwise wasted.

Attractive price. Complete information on request

Chattanooga Machinery Company
Chattanooga, Tenn.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.

To **Woodworkers and Furniture Manufacturers**

Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

We are always pleased to quote prices and give any information you may desire. Try us on your next order.

THE
Brantford Pattern Works
BRANTFORD

New and Used Woodworking Machinery

WE CAN SAVE YOU MONEY

Look over our partial list and if you do not see your requirements there—write-wire-or phone us:

60" Three Drum Berlin Sander
42" Two Drum Cowan Sander.
Goldie McCullough Sash & Door Clamp.
24" Major Harper Poney Planer.
36" Preston Band Saw
8" Four Sided Moulder.
8' American Swing Saw.
Trim & Rip Saw, Wood Frame.
24" Preston Power Feed Jointer.
6" C.M.C. Single Head Sticker.
Dowel Machine C.M.C. 5/8", 3/4" and 1" Heads.
Automatic Cut Off Saw.
Power Feed Rip Saw.
10" and 16" Jointers.
15 gal. Glue Cooker.
Trim & Rip Saw, Ballantyne & Co.
Also a full line of transmission Supplies and motors

General Machinery Company
67-69 Frederick St., Toronto
TELEPHONE MAIN 2200

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANER BELTS
Mechanical Leathers Limited, Toronto.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Calhoun Plywood Co., Sheboygan, Wis.
Wisconsin Veneer Co., Rhinelander, Wis.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R,, Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P.B. Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Woodworking Machinery Co. of Buffalo, Buffalo, N.Y.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Bruce Woodworkers Ltd. Chesley, Ont.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont
McKnight & Son Co., L. G., Gardner, Mass
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.

TRIMMERS
Arbuthnot Lumber Sash & Door Co., Vancouver, B.C.
Canada Machinery Corporation, Galt, Ont
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind
Oliver Machinery Co., Grand Rapids, Mich.
Shantz, P E., Preston, Ont.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.
Walter & Sons, J. Kitchener, Ont.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

MORGAN
NAILING MACHINES

Are built strongly for heavy continuous service. Machines adapted to all kinds of special nailing.

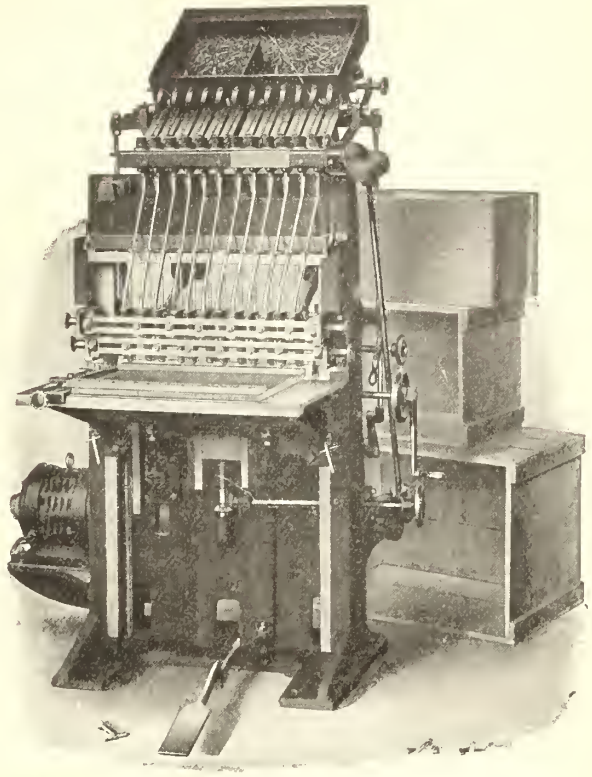
Regular machines for all sizes of boxes and crates.

Write us for descriptive literature.

Machines that save money

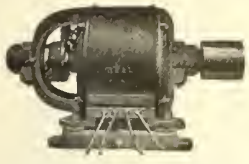
Morgan Machine Co.

DEPT. A ROCHESTER, N.Y.



Morgan No. 12-30 Open Back Nailing Machine, Fitted with motor.

Is it economical ?



Is it the right type ?

Is it the right size ?

THREE GUESSES

Electric power, heating, lighting and equipment problems are to be found in the lumbering and woodworking industries.

Perhaps your output can be increased? You are, perhaps, losing electrical energy by wasteful types of motors? Are your switches and wiring devices up-to-date or are you in continual danger of fire?

We shall be pleased to answer any questions or help you with any problems whenever you care to write us.

Electrical
Engineering Contracting **News** Merchandising Transportation

The National Authority

Toronto, 849 West Adelaide Street; Winnipeg, Travellers' Building; Vancouver, Winch Building.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Frye Lumber & Veneer Co., J. W., Dayton, O.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Northwestern Cooperage & Lumber Co., Glad stone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City. Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland Me.
Stimson Veneer & Lumber Co., Memphis, Tenn
Talge Mahogany Co., Indianapolis, Ind.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Wisconsin Veneer Co., Rhinelander, Wis.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.
Van Atta & Co., E. B., Olean, N. Y.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

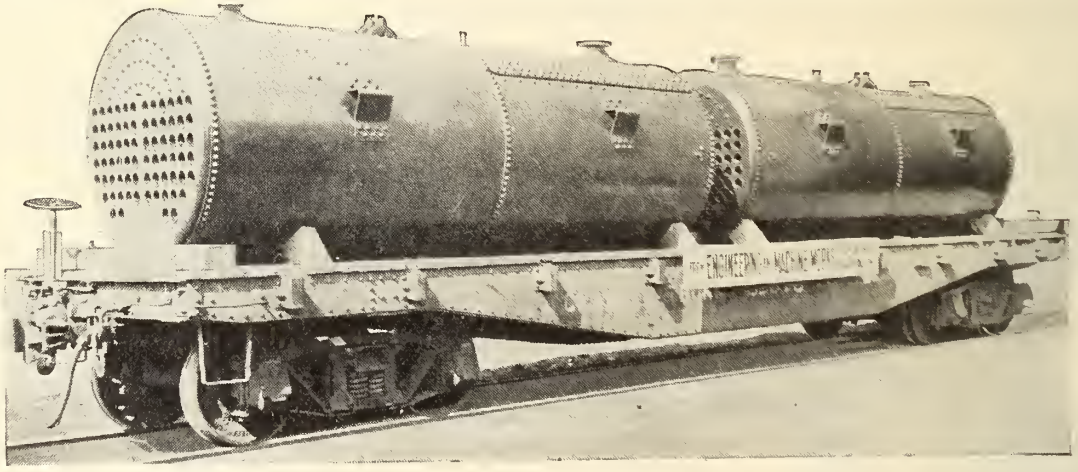
WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P.B. Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.



Make a dividend out of your Boiler

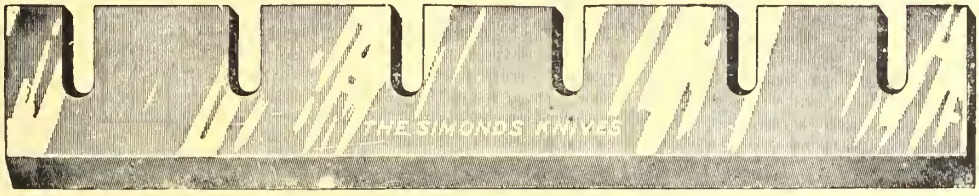
Don t forget that your old Boilers may be fuel robbers and steam wasters. Many a dividend will be made in 1922 through new Boilers being put in which will increase efficiency, save coal and reduce costs. We make Boilers—all types—at very close prices.

Engineering and Machine Works of Canada, Limited

St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal

SIMONDS
Machine Knives



Every Planer, Veneer, Hog Knife or any other of the various kinds of Machine Knives bearing the Simonds Trade Mark is backed by the guarantee of the World's largest makers of Machine Knives. These knives are high grade steel, perfectly ground and balanced. They hold their cutting edge and produce smoother lumber.

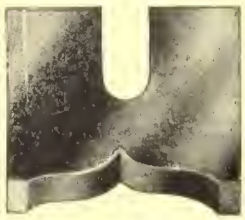
Write for catalog and prices.

Simonds Canada Saw Co., Limited

Montreal, Que.

St. John, N. B — Vancouver, B. C.

ATKINS
STERLING QUALITY
SAWS and KNIVES
CUT?



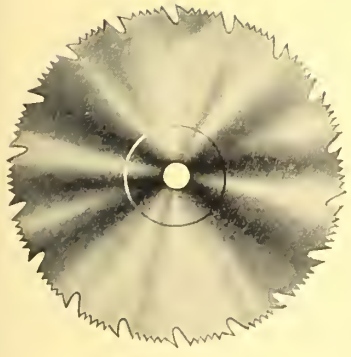
You Said It!

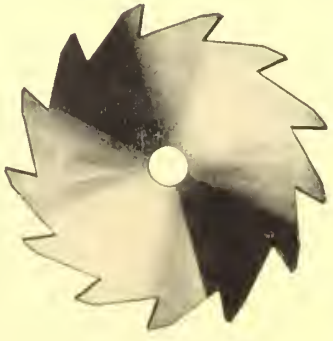
You can find low cost in Atkins Saws and Machine Knives. It's in their long service.

For efficient cutting in all kinds of timber, they they have no equal.

It's Atkins formula for the steel that makes them do the excellent work for which they are famous. This, together with the acme of perfection in temper and workmanship, have made them known as

"THE FINEST ON EARTH"





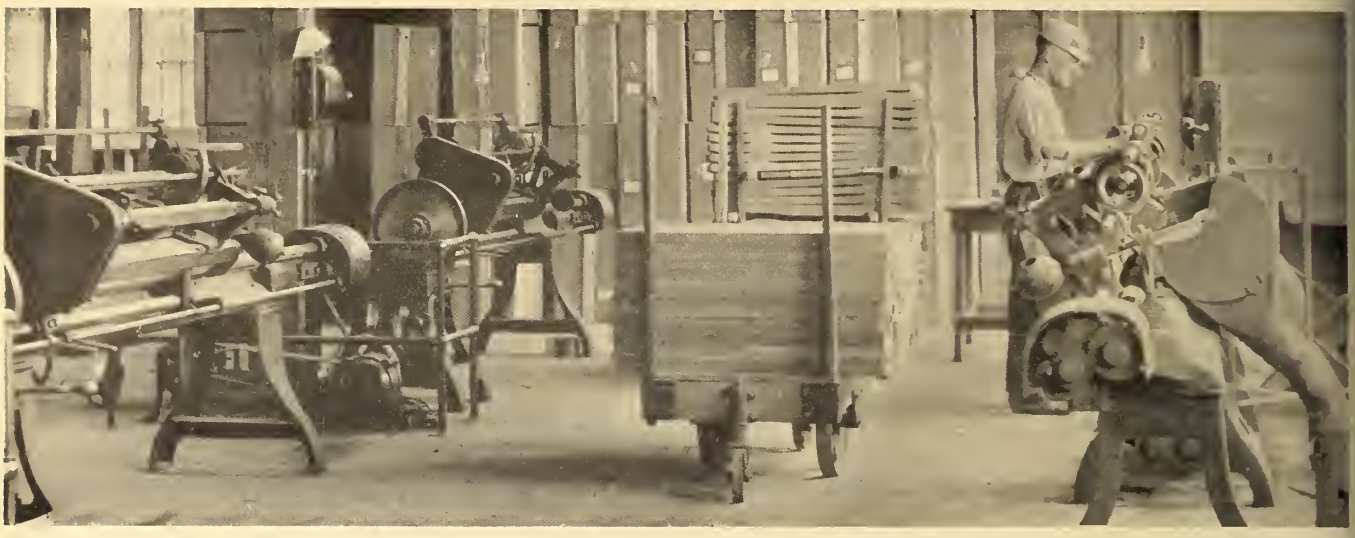
Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.

E. C. ATKINS & CO.

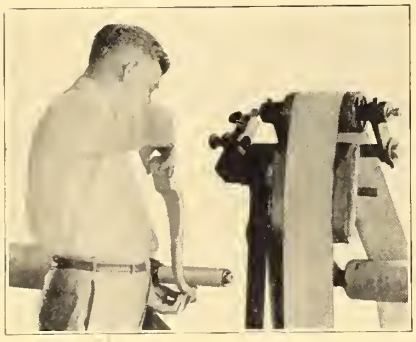
Makers of Sterling Saws

Factory—HAMILTON, Ont. — **Vancouver Branch—109 Powell Street**

One Man Shapes and Finishes Queen Anne Legs



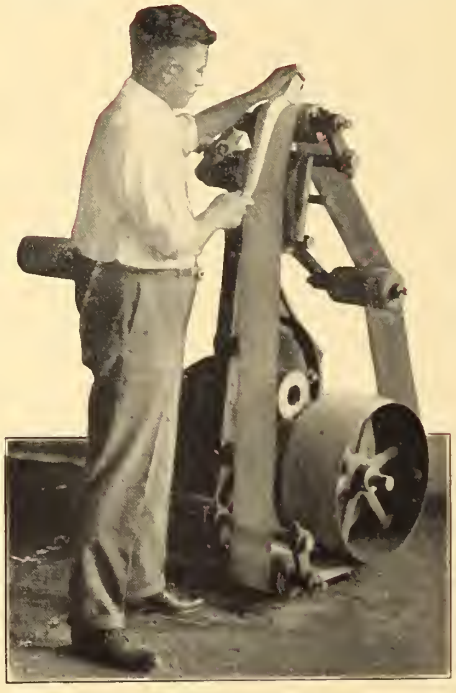
The manufacturer of Queen Anne styles can now produce the legs at exceptionally small labor cost. One man can look after the automatic leg-forming lathe in connection with the operation of the belt sander or other machine; or as many as four of the lathes can be handled by one man, because the cutting operation is purely automatic.



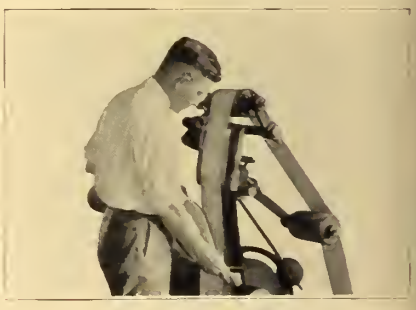
Pneumatic sanding drums supply just the right resiliency for cleaning up the extreme curves

FOR your beautifully designed cabriole patterns there is no other machine so well suited as the Mattison "214" Automatic Leg-Forming Lathe. It is specially designed to produce the irregular-shaped Queen Anne legs accurately and at a minimum labor cost. The cutting operation is purely automatic which reduces the labor to the actual time required to change stock. The man who tends the lathe can sand a leg on the "115" Belt Sander while another is being cut in the machine.

The Combination Makes an Efficient Method



Sanding flat curves against cushioned sanding roll



The flexible open belt nicely finishes the rounds

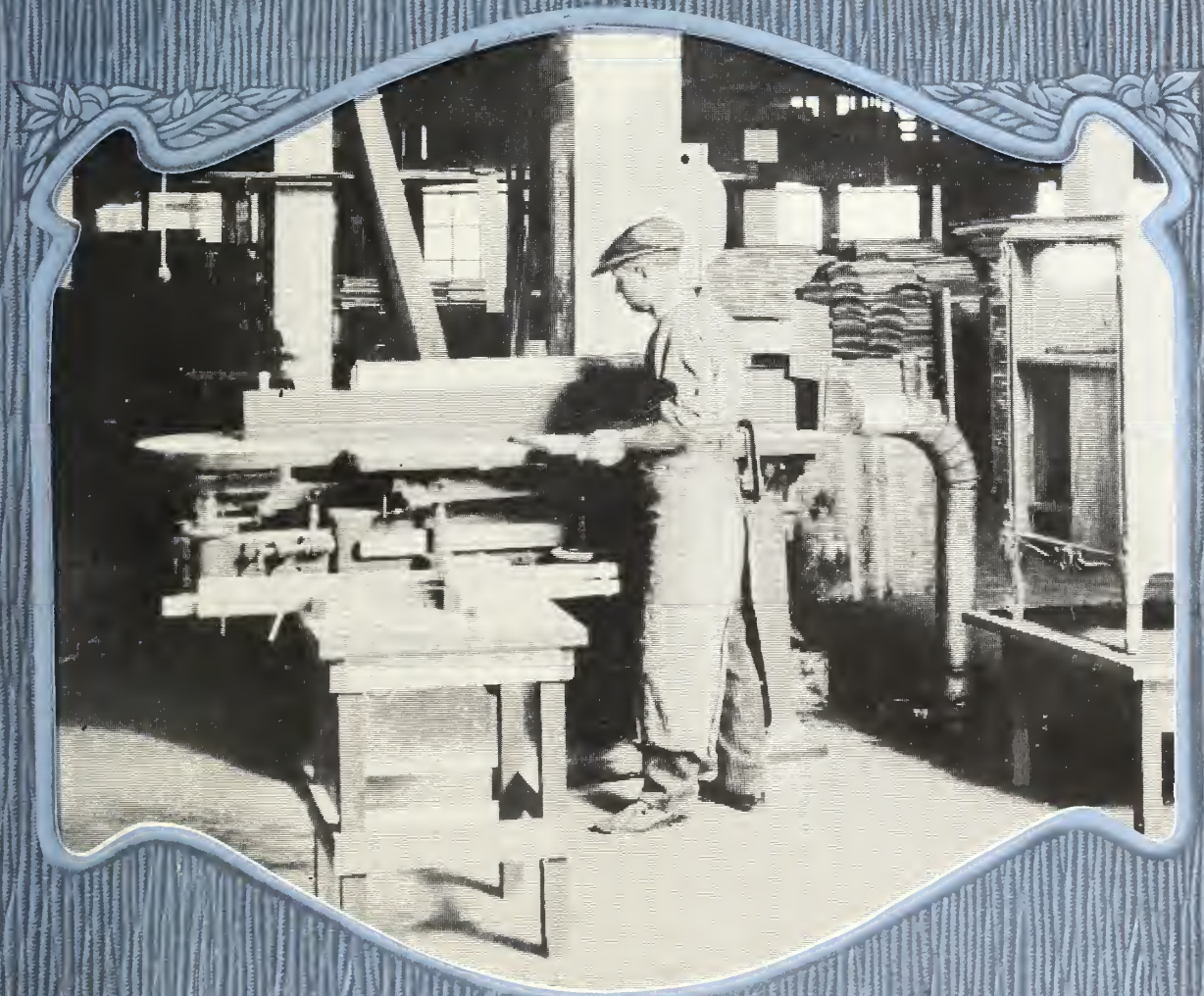
BY free-hand manipulation of the leg diagonally against the open sandbelt, shaped forms or cushioned sanding rolls, the rough sanding is accomplished very quickly. The two sizes of pneumatic sand-covered drums provide a most practical and accurate method for perfectly finish-sanding the legs. This combination of both rough and finish sanding operations in the one machine together with the lathe for automatically shaping the legs, gives the manufacturer of Queen Anne furniture a method that minimizes costs and insures accurate production of his individual and distinctive patterns.

MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.

CANADIAN WOODWORKER

and

Furniture Manufacturer



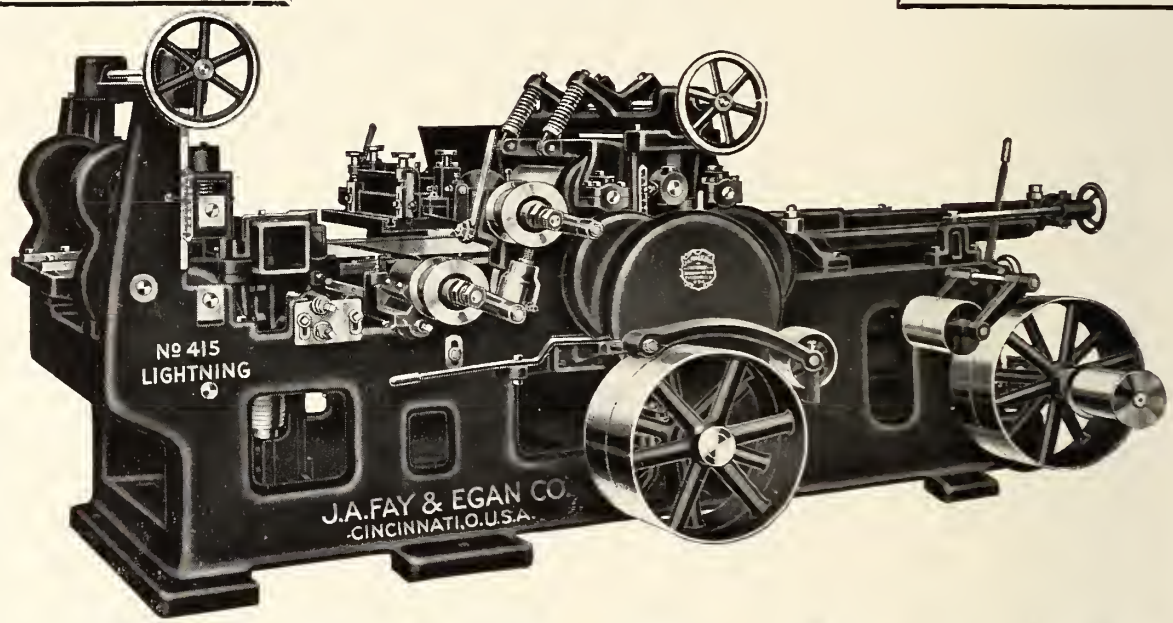
Modern Methods
Furniture Number

The Class of Work a No. 415 Will Do Is Beyond Criticism

The greatest general purpose Planer, Matcher and Molder presented to the woodworking industry in years.

Made in Three Sizes, 16", 20", 24" wide and 8" thick.

No. 415 has successfully met the requirements of Planing Mills and other woodworking plants for working hard and soft woods.



No. 415 "Lightning" Fast-Feed Double Cylinder Planer and Matcher

Each belt has Gravity Tightener for taking up stretch.

Write for Bulletin C-11 for additional information.

No. 415 is easily accessible for all adjustments and for setting up, saving much valuable time every day.

"The Lightning" Line
TRADE MARK REG.

It will not tear out or raise the fuzz on knotty or cross-grained stock. First costs and operating expenses are well within the reach of any mill owner.

J. A. Fay & Egan Company

Established 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St., CINCINNATI, OHIO

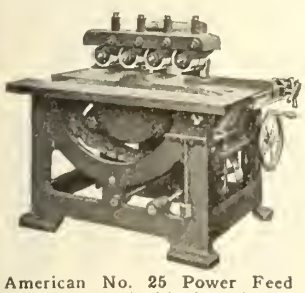
Exclusive Agents for the Dominion:—A. R. Williams Machinery Company Limited, Toronto, Ontario
Branches:— Montreal, St. John, N.B., Winnipeg, Vancouver.

PARTIAL LIST OF A 1 BARGAINS IN WOODWORKING MACHINERY

Some new—others practically so—all at very attractive prices. We have many others
If you don't see what you need listed, ask us for particulars

1—Used Double Dowel Machine,
1—Used Bowmanville 4" Sash Sticker,
3—Used Machines for turning Mouldings,
1—Used Cowan Door Relisher
1—Used McGregor-Gourlay Door Clamp,
1—Used Sturtevant 36" Single Fan
1—Used " 45" Double Fan
1—Used " 48" Single Fan
7—Used Bowser Tanks,
1—Used Double Spindle Boring Machine,
1—Used Kelley Router,
1—Machinery Co. of American 5' Back Gauge,
1—Used American No. 2½ Tenoner,
1—Used Ballantine, Two Spindle Shaper,
1—Used C.M.C. No. 438 Arm Sander,
1—Used C.M.C. No. 507 Power Chisel Mortiser,
1—Used Preston 36" Band Saw.
1—Used Preston No. 127 Variety Saw Bench,
1—Used Preston No. 121 Pony Planer, 24"
1—New American No2. Disc and Spindle Sander,
1—Used Oliver No. 8 Wood Trimmer,
1— " Cowan 13" Four Side Moulder,
1— " Cowan M-277 32" Automatic Knife Grinder,
1— " Single Spindle Vertical Boring Machine
1— " Post Borer,
1— " Jackson-Cochrane Power Feed Rip Saw,
1—New American No. 30 Universal Saw Bench,
1— " " No. 25 Edging and Ripping Saw,
1— " " No. 3 Double Cut-off Saw,
2—Used American No. 229 9" Hardwood Planer and Matchers
1—Used American No. 22 Four Side Moulder,
1— " Hespeler, 10" Four Side Moulder,
1— " Houston 8" Four Side Moulder,
1— " American No. 2 Hand Feed Rip Saw,
1— " American 36" Double Disc Sander,
1— " Berlin 36" Three Drum Sander,

1—Used American 24" Jointer with power feed attachment.
1— " Dodds 10 Spindle Dovetailer,
1— " Reynolds Screw Driver,
1— " Covel No. 40 Automatic Saw Sharpener,
1— " Cowan 10" Four Side Moulder,
1— " Francis 24" Glue Spreader,
1— " Jackson-Cochrane Chair Seat Former,
1— " Four Spindle Horizontal Boring Machine,
1— " Knob Turner,
4— " Embossing Machines for mouldings
1— " Goldie-McCulloch Two Spindle Shaper
1— " Goldie-McCulloch Dowel Sticker,
1— " Revolving Bed Planer, 24"
1— " Cant-Laidlaw 8" Four Side Moulder,
1— " Cant-Gourlay 8" Four Side Moulder
1— " McGregor-Gourlay Small Self-feed Rip Saw
1— " Crescent Small Rope Moulding Machine
1— " Arm Sander,
1— " Goldie-McCulloch Single End Tenoner,
1— " Cameron & Co. Single End Tenoner,
1— " Cowan Horizontal Chisel Mortiser,
1— " Jenkins Veneer Jointer,
1— " Preston Veneer Taping Machine,
3— " Veneer Lathes, 130", 88", 54",
Swing Cut-off Saws,
Veneer Clippers,
1— " Beach Double Cut-off Saw,
1— " Box Ripping Saw Table,
1— " Elliot No. 5 Woodworker,
1x— " Merritt Re-driers,
Vegetable Glue Mixers,
Hydraulic Press,
1— " 54" Band Resaw
1— " Yates 49" Endless Bed Planer
1 " Roller Table Belt Sander
1— " Yates Double Cut-off Saw
" Variety Saw Tables,
" Universal Saw Tables and many others.



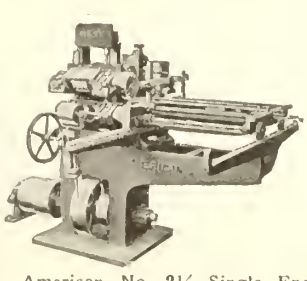
American No. 25 Power Feed Edging and Ripping Saw

Garlock Machinery Co. Limited

163 Dufferin Street

WINNIPEG TORONTO MONTREAL

Everything in Woodworking and Metal Working Machinery



American No. 2½ Single End Tenoning Machine

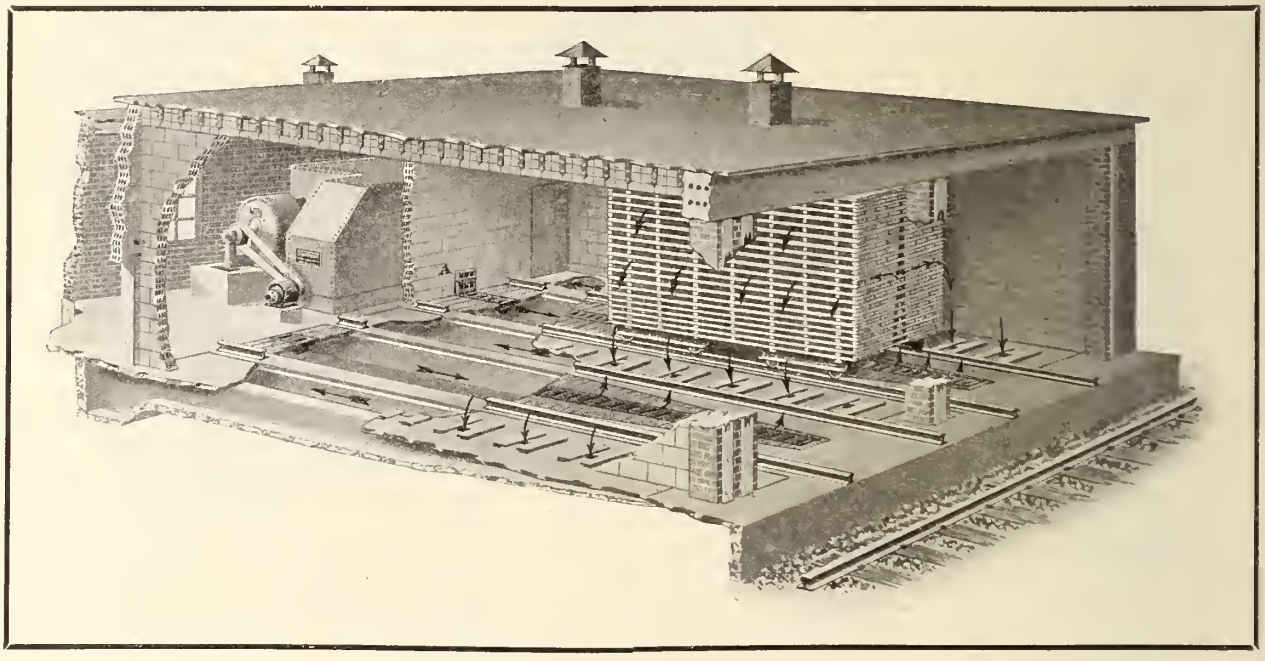
MADE IN CANADA

Sturtevant
(TRADE MARK)

HIGH HUMIDITY DRY KILN

FOR

QUALITY SPEED ECONOMY



"The Kiln With a Circulation You Can Understand"

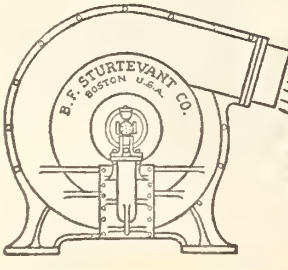
B. F. STURTEVANT COMPANY OF CANADA, LTD.
Montreal Galt Toronto

—Territorial Representatives—

FRYER-BARKER CO.
Vancouver, B. C.

EMPIRE ENGINEERING & SUPPLY, CO.
Edmonton, Alberta

KIPP-KELLY, LTD.
Winnipeg, Man.

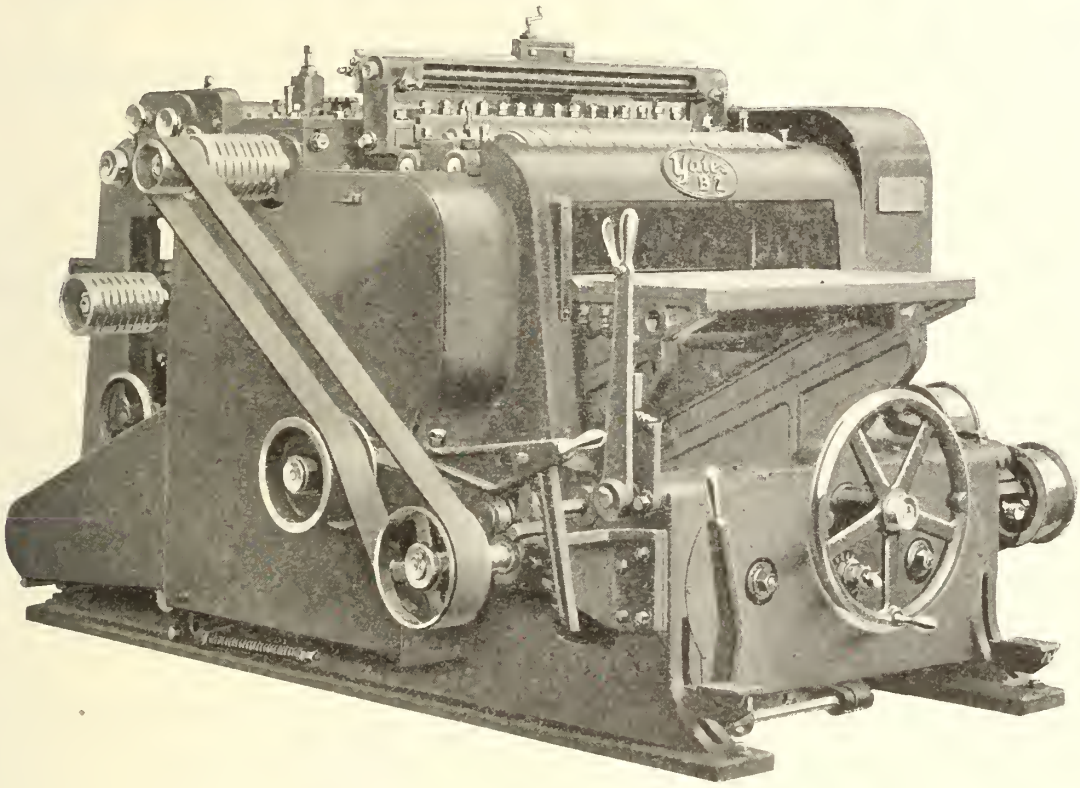


Sturtevant
REG. U.S. PAT. OFF.
PUTS AIR TO WORK

LATEST ADDITION

Yates Type B2 Yates

Double Surfacer



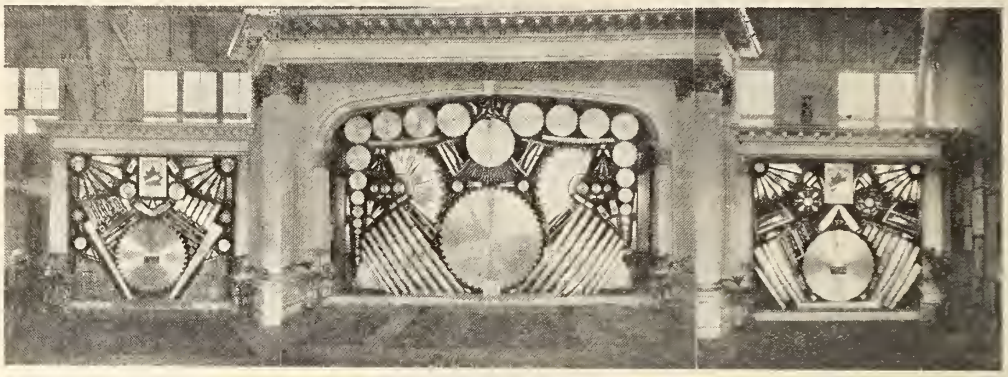
The machine shown above is the latest addition to the already large family of Yates Surfacers. Yates B2 is the last word in Surfacer construction. Designed and built to produce quality lumber at feeds up to 100 feet per minute and still maintain that fine finish which is required by furniture manufacturers. Stock surfaced on the B2 is so smooth and uniform in thickness that it requiries but little sanding. Built 30 inches wide. Will surface stock from ⅛ to 7 inches in thickness.

Our new four page illustrated circular explains this machine fully. Write for your copy and get the latest data on surfacers.

P. B. Yates Machine Co. Ltd.

Hamilton - Canada

MAPLE LEAF SAWS



A Saw For Every Purpose

Used by all the principal Woodworking & Furniture Mfgs.
Throughout Canada

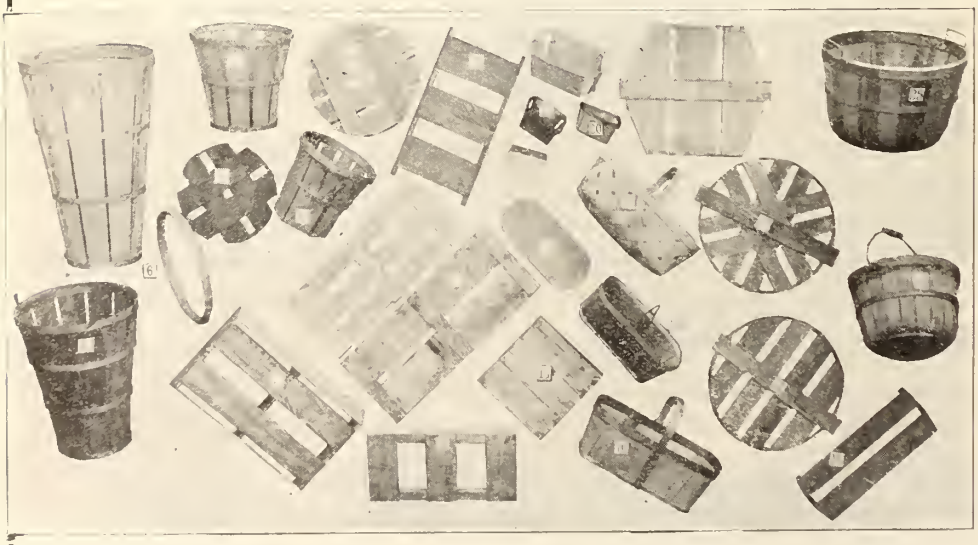
Cross-Cut Saws
Band Saws
Dado Heads

Special Saws
for
Special Work

Circular Saws
Hand Saws
Woodworking Cutters and Knives

Manufactured by
SHURLY - DIETRICH, LIMITED, The Largest All-Canadian Saw Manufacturers
GALT, Ontario

THIS IS THE NAME



of the Machinery for the Rapid Production of

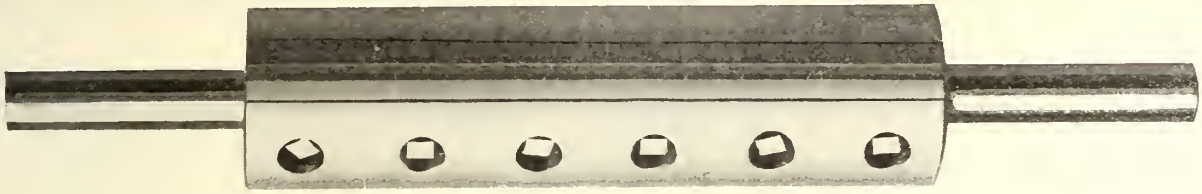
Veneer—Crates—
Baskets—Fruit Packages.

"ST JOE"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

The Shimer Round Safety Cylinder with High Speed Knives



A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

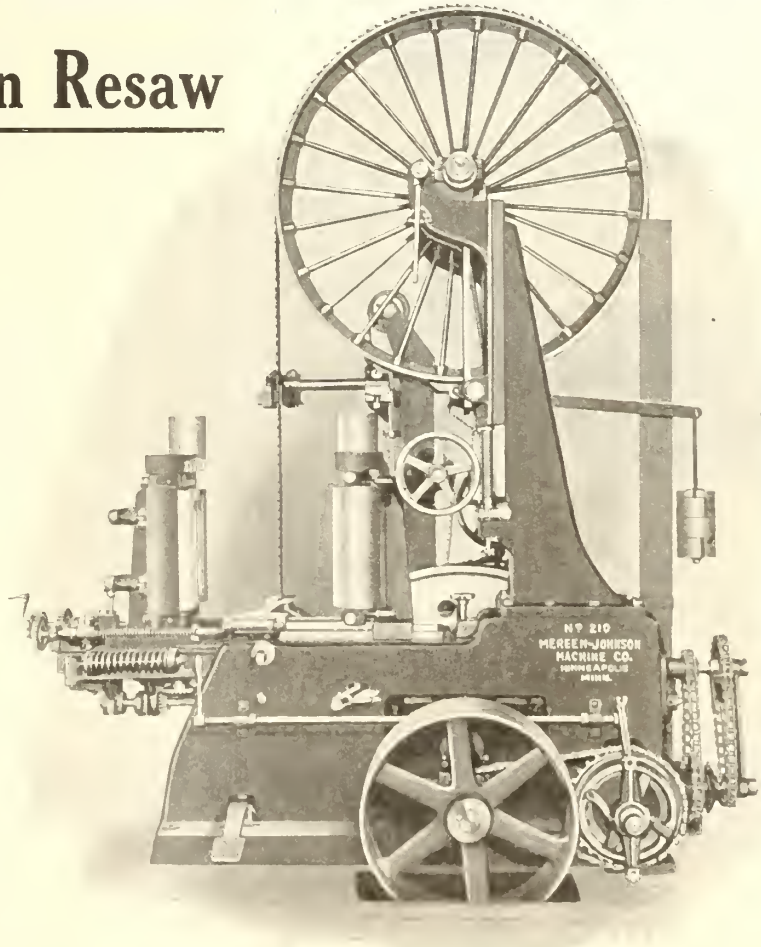
The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

No pulleys—no belts—no frictions.

The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

Write for circular.



Mereen-Johnson Machine Co.

Minneapolis Minnesota, U.S.A.

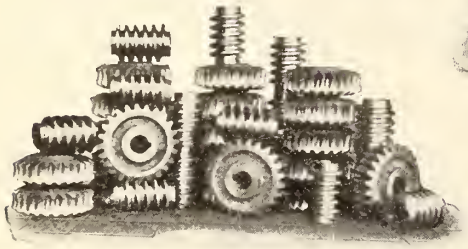
Cut Gears

Our Plant is At Your Service

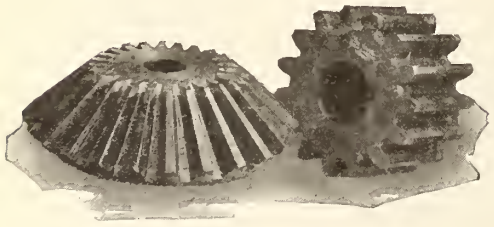
Capacities :—

Spurs Gears	91″ dia.
Internal Gears	26½″ dia.
Bevel Gears	62″ dia.
Worm Gears	52″ dia.
Helical, Spiral, & Double Helical,	.51″ dia.
Racks,	45 ft

Double Helical Gears



Worms and Worm Gears



Raw Hide Pinions

Write us for Quotations on any kind of gears.

Hamilton Gear & Machine Co.

76 Van Horne St. - Toronto

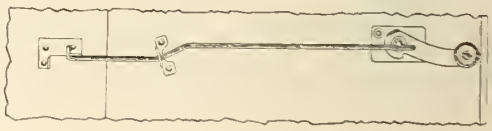
Factory for Sale or Rent

35,000 sq. ft. floor space. Situated at Alliston, Ontario, 50 miles from Toronto on main line of C. P. Railway, also on the G. T. Railway. Splendid brick building, 10 acres land. Building equipped with steam power plant, electric wired for power and lighting, large elevator, good dry-kiln. Immediate possession. Town will grant tax exemption.

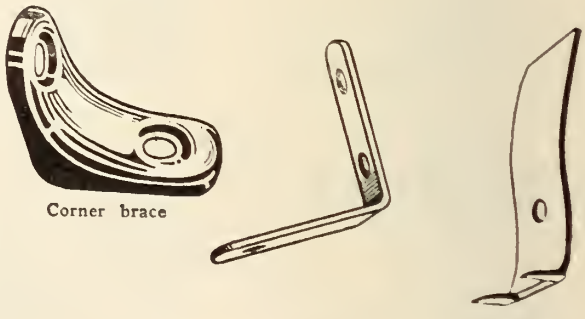
Price and terms reasonable

Apply W. H. Westman

Chatham - Ontario



Extension Table Lock



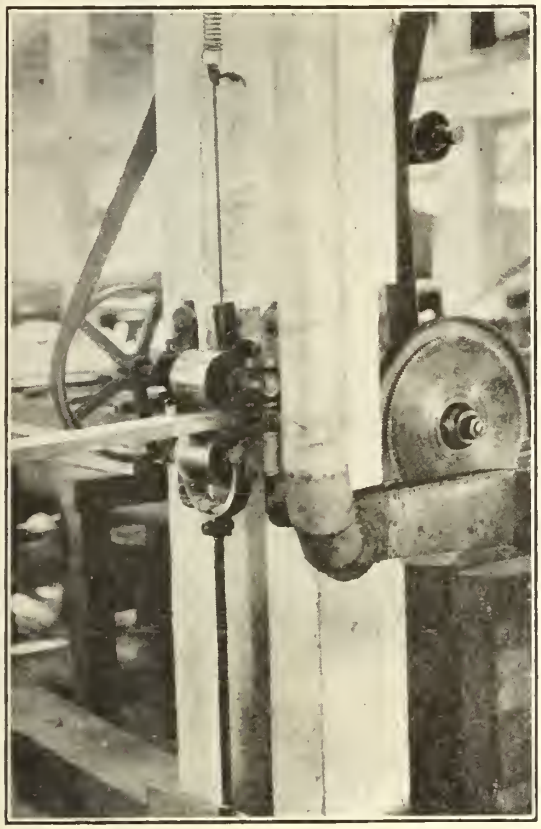
Furniture Trimmings and Special Hardware

We Also solicit your enquiry for Special Stampings

Larsen & Shaw, Limited

Walkerton, Ontario

A Real Trimmer



This is a high speed machine to be used in sawmills and box factories where speed is required. Allows men to use both hands when trimming. Nothing to get out of order. This is the fastest trimmer on the market.

Arbuthnot Lumber, Sash and Door Co.

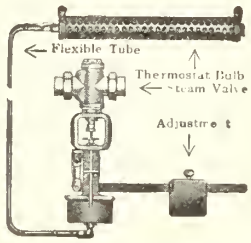
Vancouver, B.C.

He Does His Best But

A man's eye watching the thermometer. A man's hand turning the valves. He does his absolute best, but you know that his results are not uniformly right—because at some point there was too much or too little heat.

Automatic Heat Control Stops That

At best, a man can only use his judgment of temperature, which varies from one minute to the next.



The Powers Regulator No. 15

Entirely self-contained, requiring no air or water pressure for operation. Prevents checking and case hardening in the kiln. Invaluable in the varnish drying room. Other types for other places.

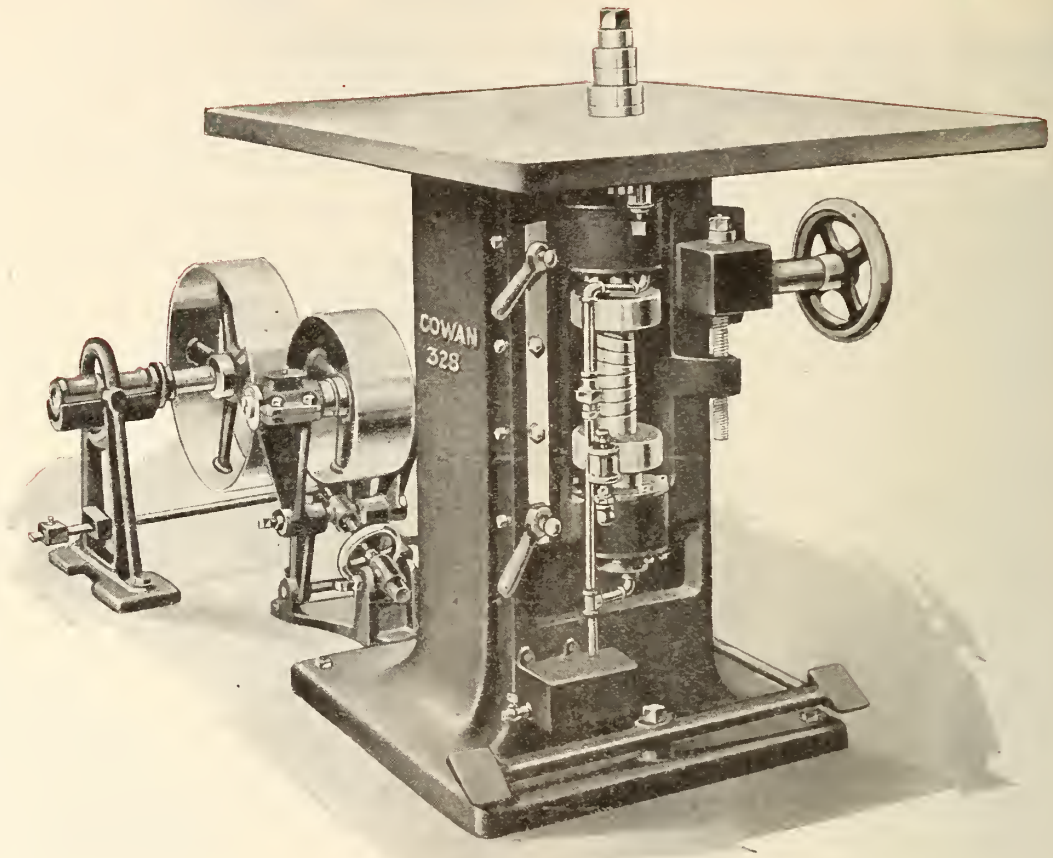
Powers Automatic Heat Regulators

Eliminate the guess work by applying the Powers Automatic Heat Regulators. They are scientifically coustructed; made to operate according to certain known physical laws. We manufacture a great variety of types suited to practically any heat regulation condition.

Consult us at once. Our long experience enables us to give you definite information and intelligent advice.

The Canadian POWERS REGULATOR CO Ltd
Specialists in Automatic Heat Control
82 CHESTNUT ST., TORONTO, ONT.
(1154E)

High Speed **Smooth Work** **Increased Production**



BALL BEARING SHAPER 328

12,000 R.P.M.

Built with one or two spindles

WE ALSO MAKE

Ball Bearing Planers — Ball Bearing Jointer
Ball Bearing Moulders — Ball Bearing Band Saws
Ball Bearing Saw Tables, etc.

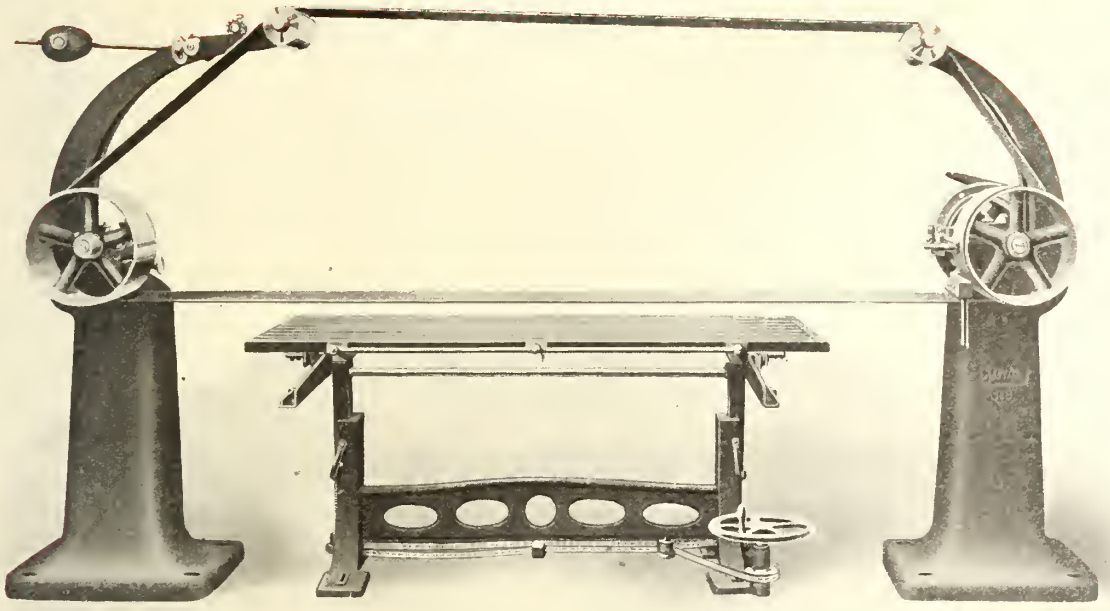
Machines arranged for Motor Drive when wanted

THE BEST IN WOODWORKING MACHINERY

Cowan & Company

GALT

Simple Substantial Efficient Practical



BELT SANDER 319

Rigid Construction. Adjustable for any length of stock. Proper sanding tension automatically maintained.

Swivel adjustment of idler and pulley on one stand by hand wheel and screw for alignment and tracking the belt when running.

Table 5½′ or 8′ x 30″

Has vertical adjustment of 11″ and equipped with roller bearings.

COWAN WOODWORKING MACHINES

Built Right,
Run Right,
Give Greatest Satisfaction
Most Satisfactory Production.

# of Galt, Limited

CANADA

Alphabetical List of Advertisers

Adjustable Clamp Company 179
Algoma Panel Co. 152
American Hardwood Lumber Co. 46
American Saw Filing Machine Co. 175
American Walnut Mfrs. Ass'n. 52
Anderson, Shreiner & Mawson 44
Anderson Tully Co. 159
Arbuthnot Lumber, Sash & Door Co. 9
Atlantic Lumber Company 45
Atlas Mfg. Co of Orlando 178
Atkins & Co., E. C. 191
Ault & Wiborg Co. 139

Bachman Co. F. M. 149
Batavia Clamv Co. 179
Banning, Leland G. 68
B. C. Lumber Commissioner 46
Behr Co., Inc. Herman 65
Bell Machine Co. 14
Bernard Company, J. 171
Bigelow-Cooper Lumber Co. 47
Barr-Holiday Lumber Co. 67
Billstrom, Nels J. 176
Birds Eye Veneer Co. 149
Black Bros., Co. 180
Bonner & Sons, J. H. 55
Brantford Pattern Works 190
Bruce Co. E. L. 72
Bruce Woodworkers 56
Buffalo Hardwood Lumber Dealers 69
Bury & Company, Robt. 78

Calhoun Plywood Co. 59
Canada Machinery Corporation 19-22
Canada Wood Specialty Co. 58
Canadian Appraisal Co., Ltd. 181
Canadian Blower & Forge Co. 42
Canadian General Lumber Co. 165
Canadian Nashua Paper Co. 72
Canadian Powers Regulator Co. 9
Canadian S. K. F. 183
Carborundum Co. 185
Carter & Co. E. T. 132
Cary Mfg. Co. 175
Casein Mfg. Co. 56
Celluloid Zapon Co. 137
Central Veneer Co. 147
Chapman &Dewey Lumber Co. 58
Chatham Malleable & Steel Mfg. Co. 8
Chattanooga Machinery Co. 190
Clamp Nail Co. 26
Clark & Son Ltd., Edward 43
Coignet Chemical Products Co. 177
Colborn, C. B. 54
Comfy Cushion Co. 132
Cowan & Co. 10-11

Delaney & Pettit Limited 131
DeVilbiss Mfg. Co. 138
Doon Twines 131
Drp Kiln Door Carrier Co. 180
Dudley Lumber Co., Inc. 45
Dunlop Tire & Rubber Goods Co. 17

Eagle-Ottawa Leather Co. 132
Eaton & Sons, J. R. 50
Elliot Machinery Co. 32
Engineering & Machine Works of Canada, Limited 188
Empire Tool Works 179

Faultless Caster Co. 36
Fay & Egan Co., J. A. 2
Fibro Mfg. Co. 68
Flint Varnish & Color Works 136
Foster, Merriam Co. 37
Frye Lumber & Veneer Co. J. W. 146

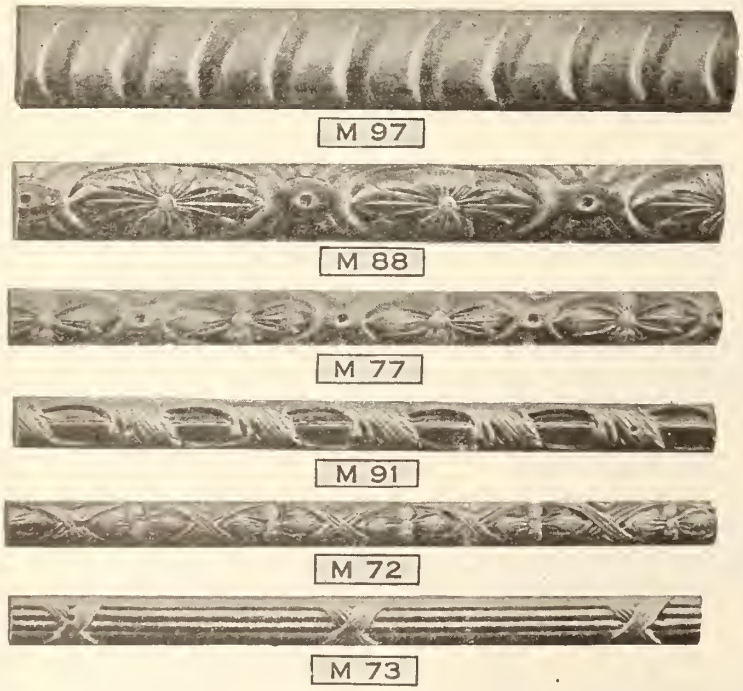
Gall Lumber Co. 165
Garlock Machinery Ltd. 3
General Machinery Co. 171
General Hardwood Lumber Co. 55
Globe Vise & Truck Co. 176
Grand Rapids Vapor Kiln 26
Gulf Lumber & Trading Co. 57

Hafner Mfg. Co. 52
Hall Bros. Ltd. 65
Hamilton Gear & Machine Co. 8
Hartzell, Geo. W. 51
Hawker Mfg. Co., W. S. 24
Hay & Company 156
Hay & Co., Peter 176
Hewitt Lumber Co., D. E. 66
Heeney, Percy E. 50
Hoffman Bros. Co. 147
Hyde Lumber Co. 55

Ideal Coated Paper Co. 65
Ideal Fence & Spring Co. of Canada, Ltd. .. 132
International Business Machines 167

Jackson, Cochrane & Co. 30-31
Johnston Lumber Company, The 78

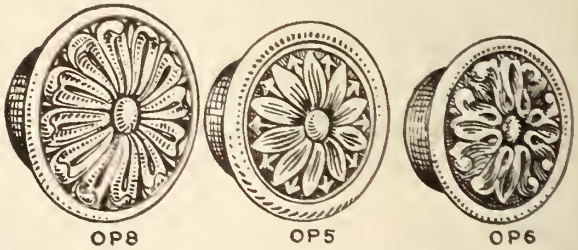
Kellogg Lumber Company 74
Kinnon Lumber Co., Ltd. 171



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

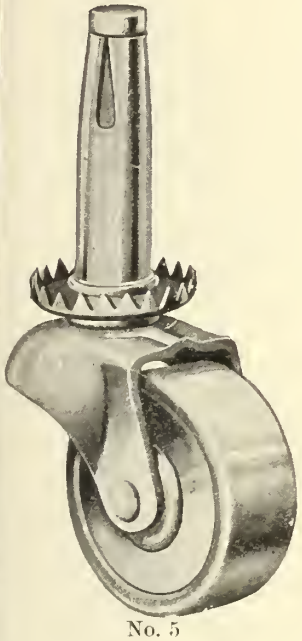


Waddell Manufacturing Company

Coldbrook and Taylor, N. W. **Grand Rapids, Mich.**

NATIONAL CASTERS

and furniture hardware



No. 5

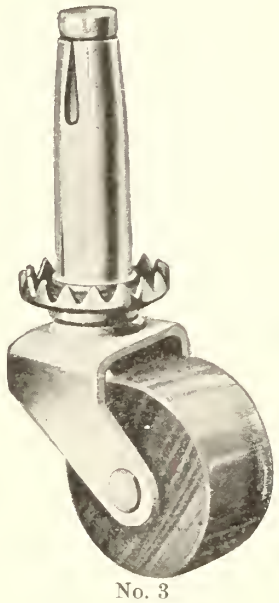
PUT your furniture on a sound National footing by using a Made in Canada Caster. That National Casters are all we claim them to be has been proved in their use by the best manufacturers in the Dominion. They have met with general approval everywhere.

What can be said of our Caster is also true of our complete line of hardware.

Get our prices.

National Hardware Co., Limited

Orillia, Ontario



No. 3

REAP THE FULL BENEFIT

¶ The business paper is to-day a forceful factor in the commercial world. It is performing a service which is of most incalculable benefit to the field it represents and the country at large. Its object is to instruct and educate—to furnish trade and technical information which cannot be found in newspapers.

¶ The reader who studies the "Canadian Woodworker and Furniture Manufacturer" from cover to cover will profit tremendously. This issue, devoted primarily to modern methods, contains numerous articles which will carry education and instruction to the receptive mind.

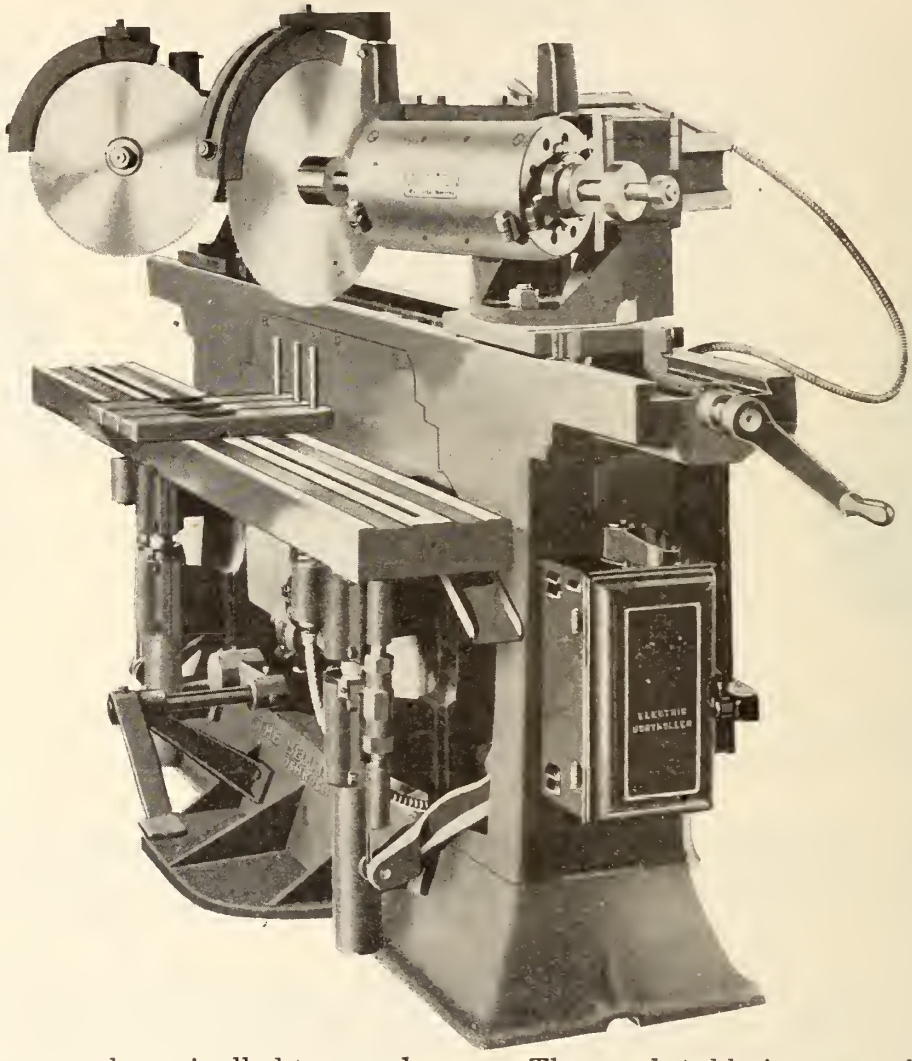
¶ The advertising pages of this number are not less interesting than the Editorial contents. They represent a directory of the leading manufacturers and dealers from whom the best equipment and supplies may be purchased. These representative firms are asking the readers of the "Canadian Woodworker and Furniture Manufacturer" for their business. They show their enterprise by judicious advertising and they deserve support.

¶ To make the most of his opportunities, the subscriber should use the advertising pages as a buyers' reference. Success in business depends in no small degree on how we buy. Study the advertising, ask for competitive prices, and take full advantage of the service this publication offers.

Canadian Woodworker and Furniture Manufacturer

THE "BELL" DOUBLE CUT-OFF SAW

Cuts Miter or Square work both ends at once
Direct Motor Driven



The saw arbors can be swivelled to any degree. The work table is power driven and, as it rises, carries the work up between the saws, cutting both ends square or on any angle desired. The machine is quickly adjustable for all angles and lengths. Compound angles can be cut both ends at once. The arbors will carry dado heads as well as saws. The variety of use to which it can be put is very great. The volume of work is very large. The operation of the machine is simple. No furniture, chair, casket, sash and door, phonograph cabinet, or automobile plant is complete without it. Furnished in either belt or motor drive.

Manufactured by

The Bell Machine Company

(Successor to The Dauber-Bell Machine Co.)

OSHKOSH, WISCONSIN, U. S. A.

Manufacturers of Dowel Machines, Dowel Cutting-Off & Pointing Machines, Stile Gluers and Flat Plate Gluers, Single and Double End Boring Machines, Combined Gluing and Dowel Driving Machines, Chair & Furniture Clamps, Tilting Door Clamps, Horizontal Swing Cut-Off Saws.

Exclusive Representatives for the British Isles: The Oliver Machinery Co., 201 Deansgate Manchester, England.

MESCo

Hot Plates for Re-Drying Veneer

Why They Succeed Where Other Devices Fail

Veneer, when ready for re-drying, has *all* of its free water removed and at least half of the fibre moisture.

The shrinkage is only partly performed.

The veneer, in fact, has reached the point where the difficulties of air drying are greatest.

It calls for the high heat of hot plates to evaporate the small remaining content of moisture.

This moisture is converted into steam by means of conduction of heat from both surfaces to the center.

The steam generated from the contained moisture reaches those surfaces which becomes moist and pliable.

A breathing movement of the plates expels the excess steam as it covers the surfaces.

It is a process of drying ***the centre first*** and the ***surfaces last.***

The sheets of veneer are held flat as they take the final set, the "breathing movement" allowing the shrinkage to take place without checking.

The heat is applied uniformly to the entire surface of the material being dried.

The application of heat is ***direct*** —no loss due to first heating a body of air which in time wastefully gives up its heat to the wood.

Humidity control in hot plates is automatic — the veneer surfaces remaining moist so long as any moisture in the wood fibres finds its way to the surface.

This humidity is greater the greater the amount of contained moisture and it automatically diminishes as the wood approaches its finished degree of dryness.

All veneer should be re-dried before gluing.

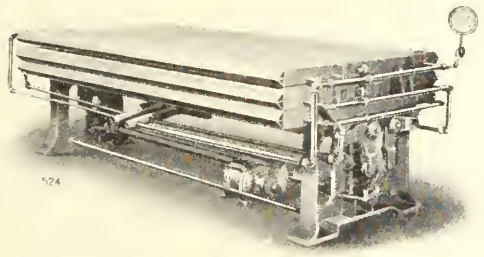
Commercial veneer contains 8 to 15 per cent moisture.

You *add* to this moisture when you pass veneer through a glue spreader.

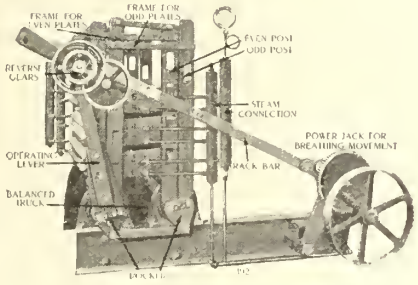
Your glued up panels should under normal conditions contain about 8 per cent moisture Therefore, you must take out as much water as you add during the gluing process and as much more as may be needed to leave the glued up stock somewhere near the 8 per cent content.

The business end of this proposition we will be pleased to take up with you by private correspondence.

"MERIT" VENEER RE-DRIERS



3 PLATE MACHINE



4 to 16 PLATE MACHINE

MERIT

VENEER MERIT MACHINERY FOR FAR SIGHTED BUYERS

MERRITT ENGINEERING AND SALES COMPANY LOCKPORT N.Y.

VENEER MERIT MACHINERY FOR FAR SIGHTED BUYERS

Alphabetical List of Advertisers—Continued

Klotz Machine Co. 180
Kosse, Shoe & Schleyer Co. 77
Kraetzer-Cured Lumber Co. 169

Laidlaw Bale-Tie Co. 178
Larsen & Shaw Ltd. 8
Litton Veneer Co. 146
Liverpool Hardwood Co. Inc. 71
London Lumber Co. 171
Long Bell Lumber Co. 75
Long-Knight Lumber Co. 157
Luehrmann Hardwood Lumber Company, Chas. F. 46

Maloy & Wertz Lumber Co. 48
Mattison Machine Works 192
May Hardwood Co. R.R. 46
McDonagh Lumber Co. 50
McKenzie Machinery Co. D. 23
McKnight & Son Co., L. G. 190
McLennan Lumber Co., Limited 58
Mengel Co., The 53
Memphis Bandmill Co. 67
Memphis Veneer & Lumber Co. 147
Mercereau Hawkins Tie Co. 70
Mereen-Johnson Machine Co. 7
Merritt Engineering & Sales Co. 15-145
Miller Lumber Co. 48
Mohawk Veneer Co. 146
Morgan Machine Co. 187
Mowbray & Robinson 63
Munising Woodenware Co. 145
Murelle Lumber Co., L. D. 57
Northwestern & Cooperage Lumber Co. 145

Nash J. M. 190
National Hardware Co. 26
National Dry Kiln Co. 59-62
Neville-Cooper Co. 56
Nichols & Co., A. S. 138
Nichols & Cox Lumber Co. 54

Oakey & Sons, John 178
Ober Manufacturing Co. 179
Ohio Veneer Co. 145
Oliver Machinery Co. 181
Oriental Textiles Co. Ltd. 130
Otis Mfg. Co. 73
Overton, S. E. 177

Paasche Air Brush Co 139
Pedwell Hardwood Lumber Co. 54
Penfound Varnish Co. 139
Penrod-Jurden Co. 148
Penrod Walnut & Veneer Co. 148
Perkins Glue Co. 35
Perrin Ltd. Wm. R. 191
Petrie Ltd., H. W. 177
Pettingell Machine Co., The 175
Pickrel Veneer Co. 150
Porter Machinery Co., C. O. 177
Preston Woodworking Mach. Co. 40-41
Purcell Walnut Lumber Co., Frank 63

Radcliff Saw Mfg. Co. 38
Reese-Sheriff Lumber Co. 77
Reynolds Machine Co. 18
Richards Hardwood Co. 44
Richards-Wilcox Canadian Co. 176
Rowe Mfg. Co., Henry 178
Rush Lumber Co. 64

Shantz, P. E. 56
Shimer Cutter Head Co. 7
Shurly Dietrich Co. 6
Sidmans Limited 161
Simonds Canada Saw Co. 189
Smith Lumber Co., Payson 46
Smith, C. W. 25
Smith, Sam D. 55
Sondheimer Co., E. 47
Spencer, C. A. 165
Standard Dry Kiln Co. 16
Standard Veneer Co. 147
Stark & Co., Jas. E. 1
Steele & Hibbard Lumber Co. .....
Stimson & Co., J. V. 6
Stimson Hardwood Co. 4
Stimson Veeneer & Lumber Co. 4
St. Joseph Iron Works .....
Stockbridge Machine Co. 2
Sturtevant Co., B. F. 4

Talge Mahogany Co. 6
Taylor Mfg. Co., Jas. L. 1
Tennessee Lumber & Coal Co. 6
Thomas & Proetz 5
Toronto Blower Co. 18
Toronto Veneer Co. 15
Turner-Farber-Love Company 16

Vail Cooperage Co. 7
Valley City Machine Works 3
Van Atta & Co., E. B. 18
Veneer Manufacturers Co. 15
Virginia Wheel & Hole Sawing Machine Company 18

Waddell Mfg Co. 1
Walter & Co., B. 17
Walter & Sons, J. 3
Wayne Lumber Company 6
Watertown Table Slide Co. 5
Whiting Co., Wm. S. 7
Willey Company, C. L. 3
Williams Machinery Co., A. R. 2
Williamson Veneer Co. 15
Wisconsin Lumber Co. 7
Wisconsin Veneer Co. 14
Wood-Mosaic Company 15

Yates Machine Co., Ltd. P. B. 5
Yellow Poplar Lumber Co. 6
Young Lumber Co., Bedna 6

"for drying GUM

Our investigation among successful woodworkers proved we should choose

The Standard Dry Kiln

because....., and we have since proved it....." The reason is shown in our literature. If you dry gum, get a copy. Or The Standard Dry Kiln Co., 1542 McCarty St., Indianapolis, Ind.

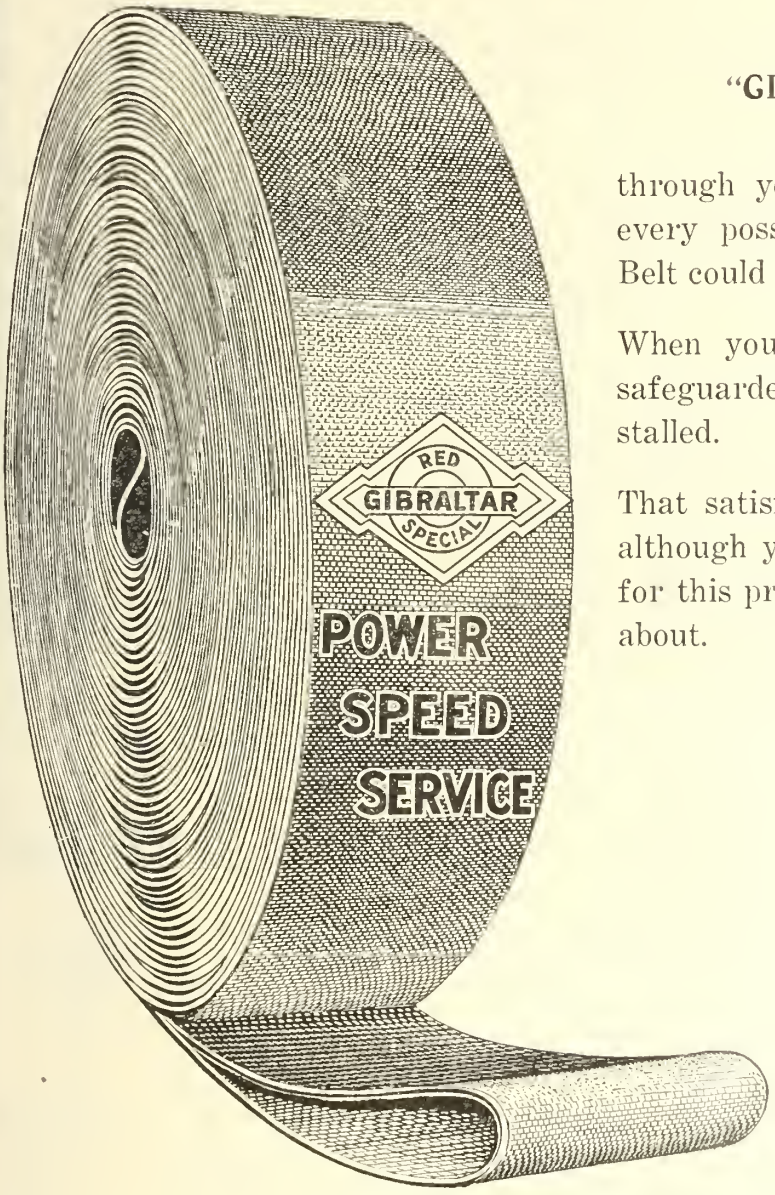
Efficiency in Belt Performance

The one thing you want to feel certain about in your Belt Purchases these days—when so much depends on the ability to lower costs and maintain quality—is efficiency in Belt Performance.

That "efficiency" has been built into

DUNLOP

"GIBRALTAR REDSPECIAL"



through years of Belt-making experience for every possible use to which a Transmission Belt could be put.

When you buy this Belt your interests are safeguarded from the very first moment it is installed.

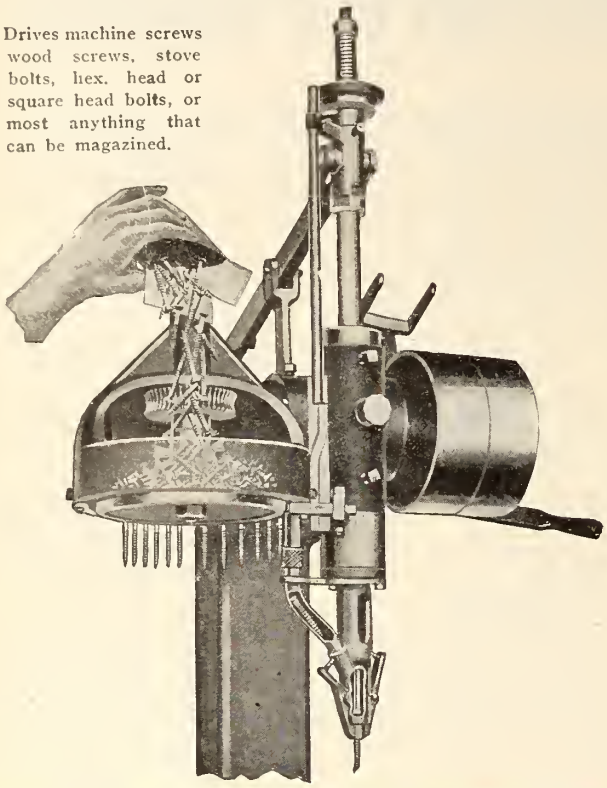
That satisfaction alone is worth considerable, although you don't have to pay one cent more for this proven Belt than one you are doubtful about.

Dunlop Tire & Rubber Goods Co., Limited

Head Office and Factories: Toronto Branches in the leading cities

The Demand is for Lower Prices!

Drives machine screws wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.



Reynolds Automatic Screw Driving Machinery will help you meet the demand

Everywhere the manufacturer is faced with the problem of price reduction. How can he find the solution?

By cutting out every waste—of time, labor materials, etc.

Many manufacturers have installed Reynolds Screw Driving Machinery for this reason. It accomplishes the work-better in one-third of the time.

Consequently they are able to meet the demand for lower prices and hasten the return to normal buying.

Are you interested? Then write us to-day for the full facts.

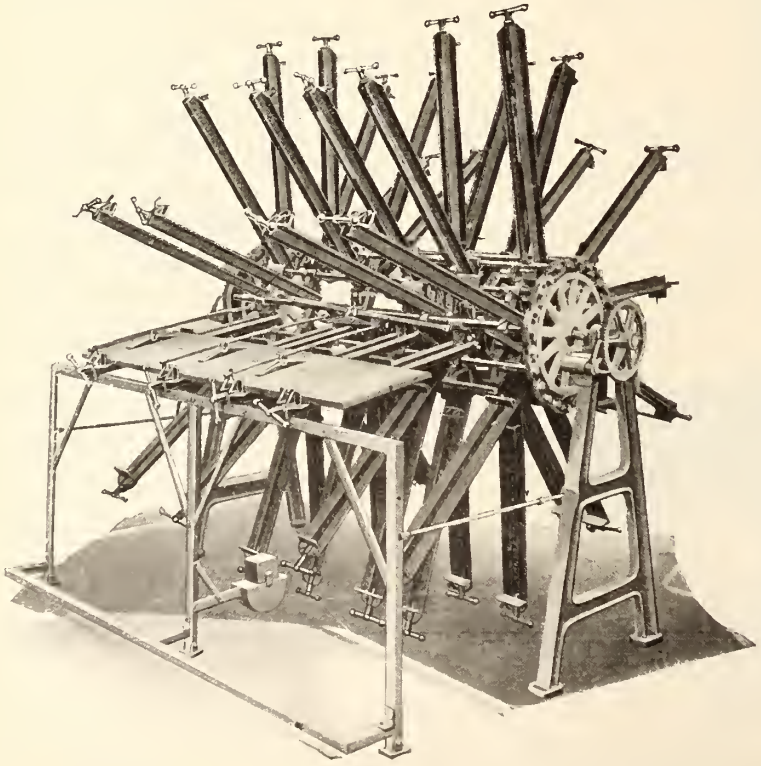
Send us dimensions over all of your work and gauge and length of screws driven so that we can determine the proper size and type machine to meet your requirements.

The Reynolds Machine Co.

Department C.

Massillon, Ohio, U.S.A.

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK REGIS. PAT. OFF

CLAMP CARRIER

for

Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.

DO YOU KNOW

THAT THE

C.M.C. ORGANIZATION

Includes the pioneers in this branch of Canadian industry, with Engineers, Designers and Mechanical experts of over forty years' experience.

This is the record that stands back of the machines illustrated on following pages and all our products

CANADA MACHINERY CORPORATION
LIMITED

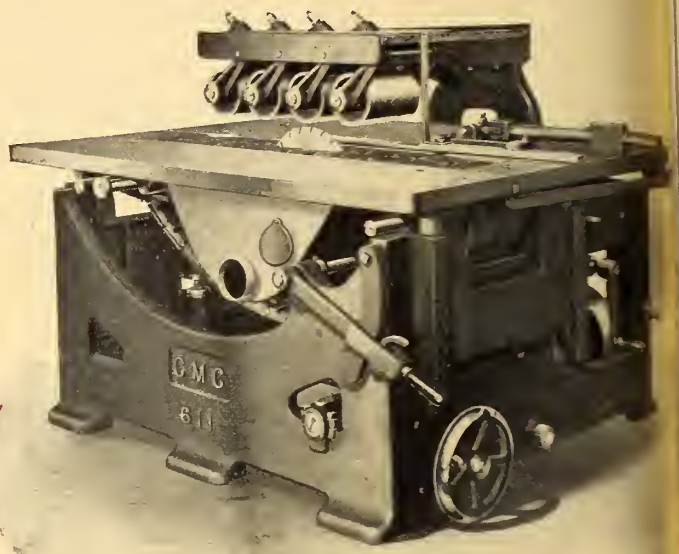
Manufacturers of

WOOD WORKING MACHINERY

Plants at GALT and HESPELER, ONTARIO

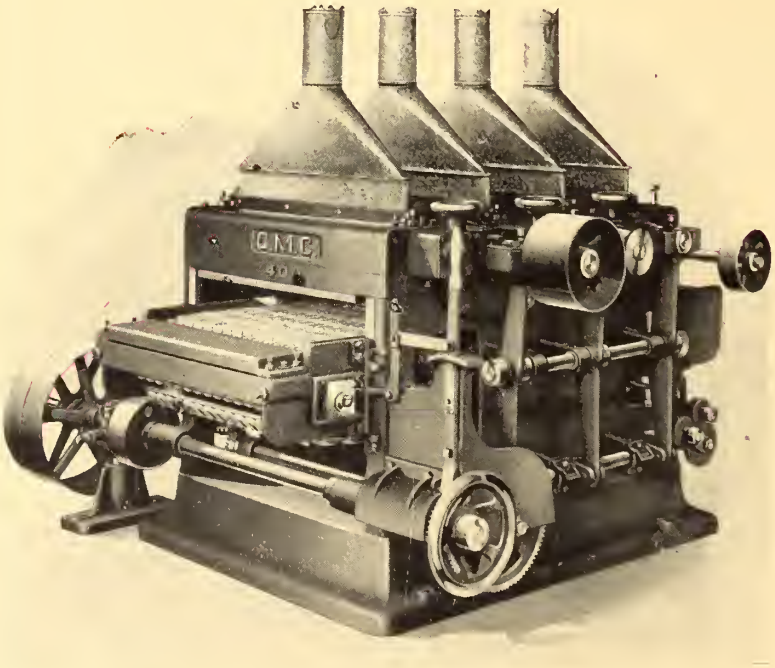
C.M.C.

OUR FAMOUS 611 STRAIGHT EDGING SAW



One of our customers installed another make of edger. Then he installed a "611". Now he says he can do in a ***half a day*** on our Saw what used to take ***two days*** to do on his first machine.

Let Us Show You What a "611" Can Do.



REVOLVING BED SANDERS

BUILT 36" 42" 48" WIDE

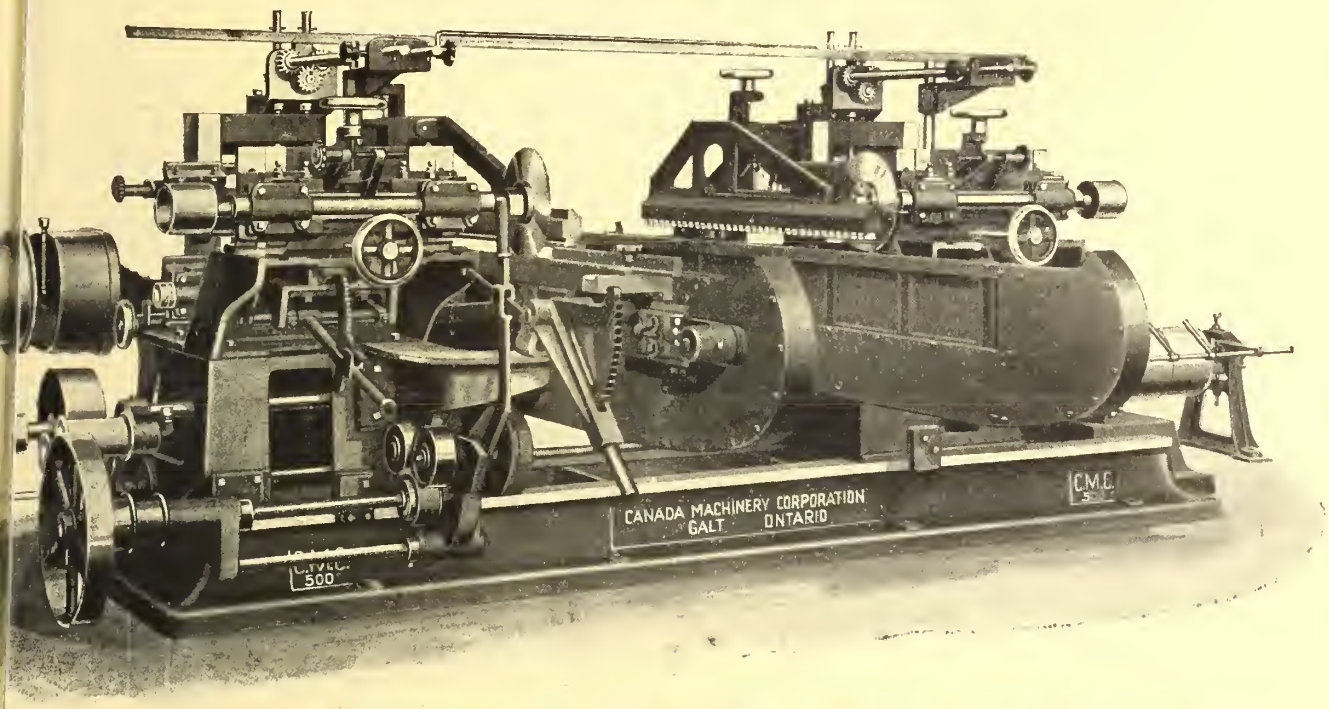
"Strong on the Finish" are these Sanders which have proved themselves capable of turning out the highest quality of work in profit producing quantities.

We have the evidence from those who know, and it is yours for the asking.

CANADA MACHINERY

GALT,

C.M.C.



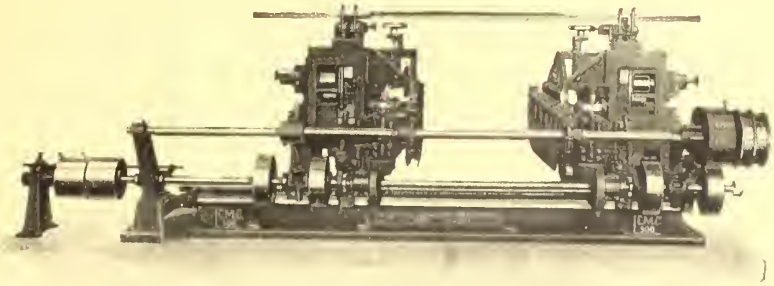
500 DOUBLE END TENONER

A labor saving and quantity production machine of the highest class. The only machine of its kind built in Canada and the superior of imported machines.

If you desire we can refer you to numerous furniture factories who are ***reducing costs, increasing output, improving quality*** and getting ***complete satisfaction*** on this tenoner.

Built with or without copes.

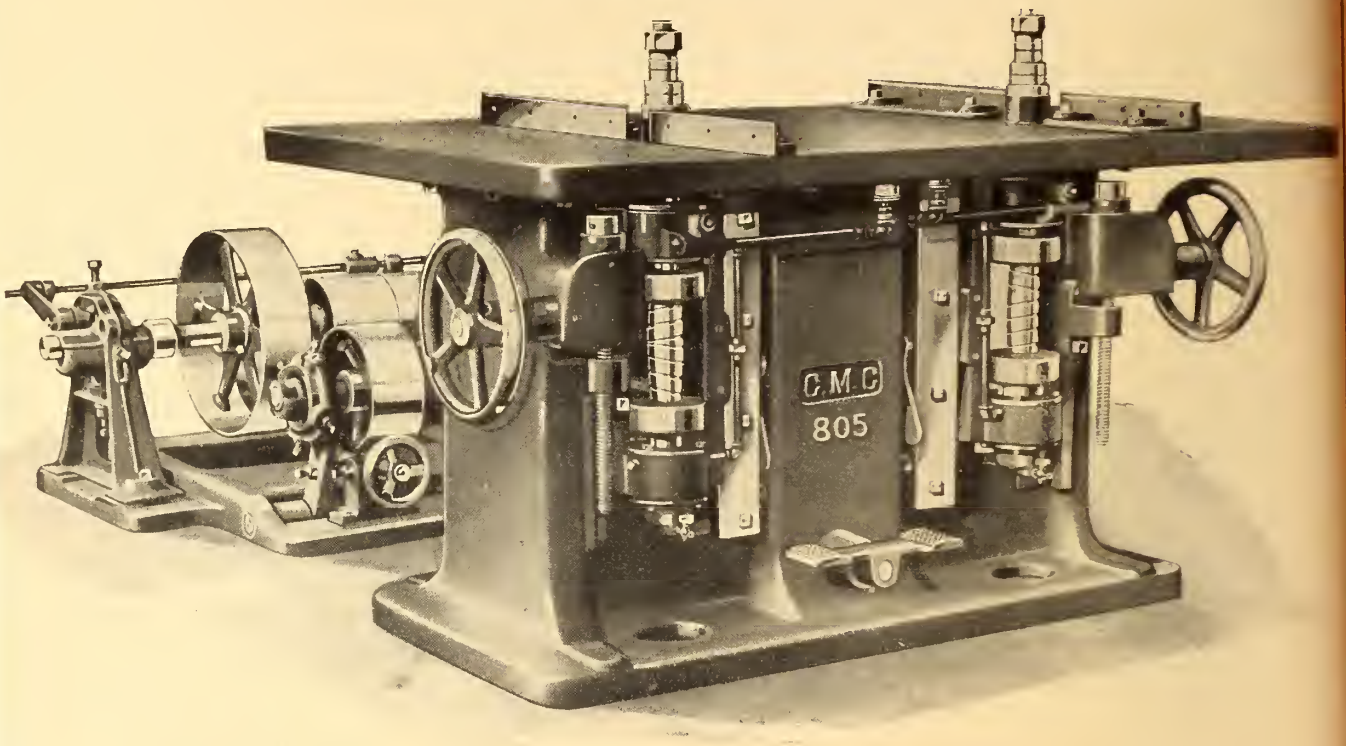
Saws can be operated independently of tenon heads.



CORPORATION LIMITED

ONTARIO.

C.M.C.

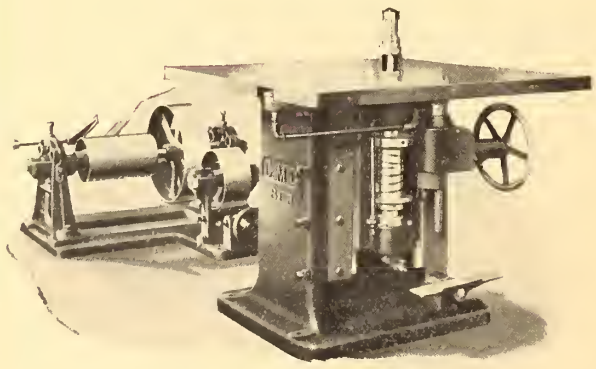


805 DOUBLE SPINDLE

BALL BEARING SHAPERS

7,000 to 12,000 R.P.M.

Our Machines are heavy, carefully built machines of the highest grade embodying the following features not found on any other machines built in Canada



803 SINGLE SPINDLE

Deep Groove-Type S.K.F. Hess Bright Ball Bearings

Continuous Visible Flow Lubrication System

Features used exclusively by the original ball bearing shaper builders

Our first ball bearing Shaper after years of continuous use has not cost its owner one cent for repairs to machine and belt.

SERVICE AFTER ALL IS WHAT COUNTS

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

A Machine of Many Uses

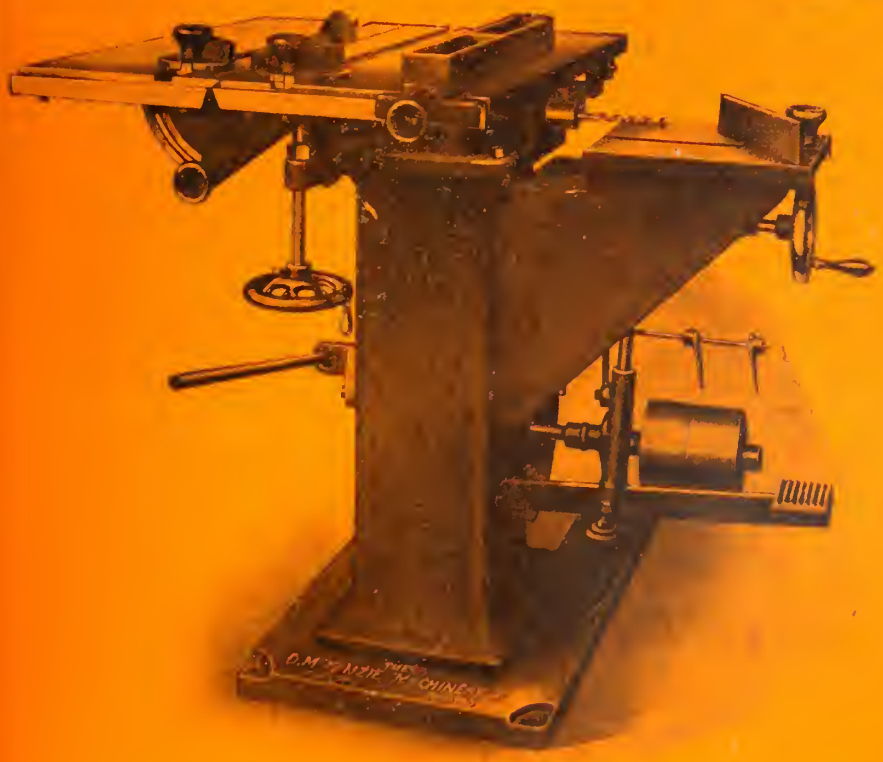
Cross-Cut, Mitre and Rip Saw, with Split Tilting Table and Boring Attachment

NO mill or factory can employ this machine without effecting a worth while saving in time and money.

It is a machine of wonderful adaptability on light or general work. The best materials are used throughout and it is very rigid and strong.

The illustration at the right shows the Cross Cut, Mitre and Rip Saw, while the lower cut shows the Split Tilting Table and Boring Attachment added.

We can thoroughly recommend it to anyone in need of such a machine and will gladly forward prices and full details upon request.

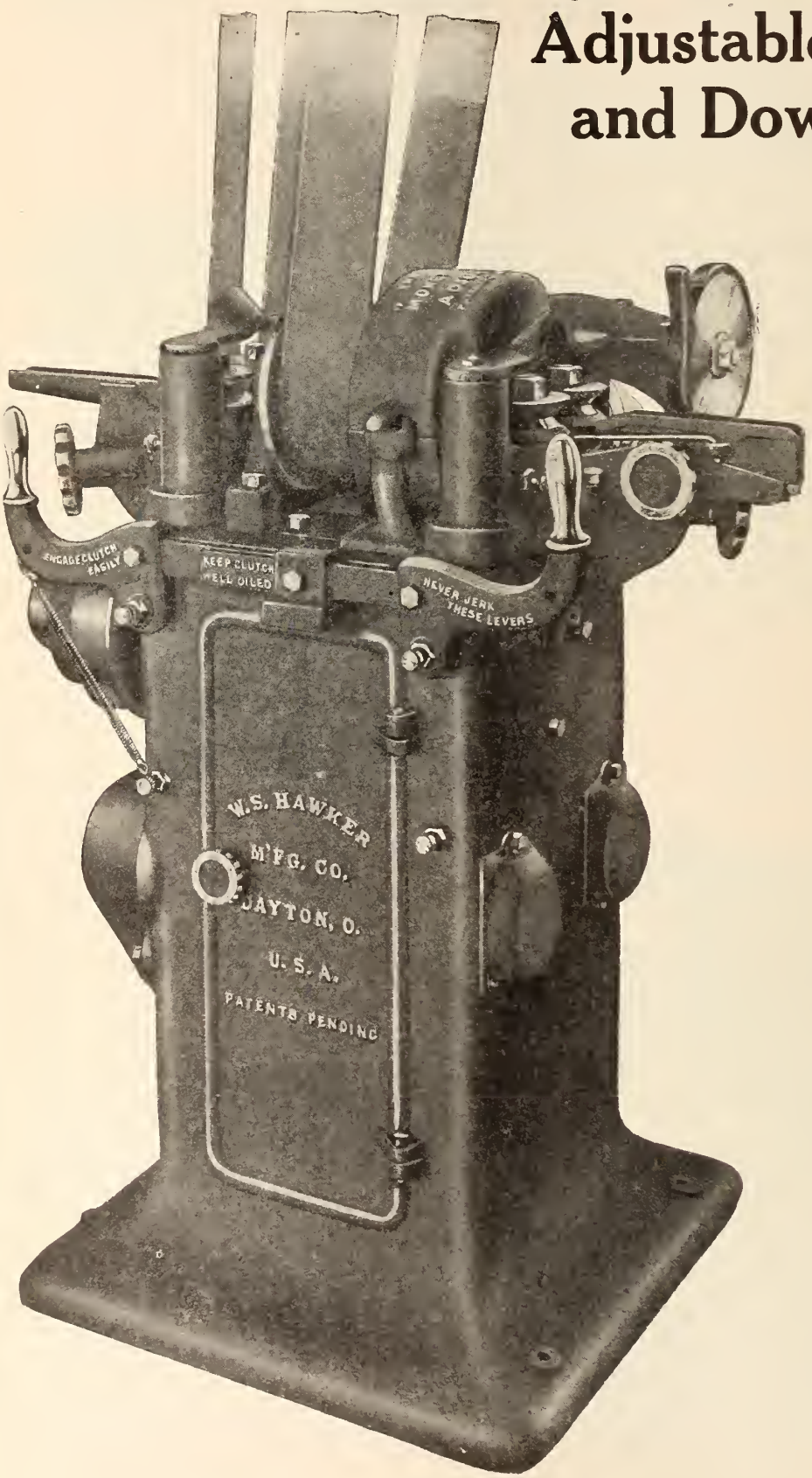


We specialize in 16 in. Back geared Crack Shaper, 14 in. x 6 ft. or 8 ft. Engine Lathes, Bench and Pedestal Grinders, Power Hack Saw Machines, Bench and Column Sensitive Drills and Saw Tables. Special Machinery built to order.

D. McKenzie Machinery Co.

Guelph - Ontario

The Money Maker—
Adjustable Rod and Dowel Machine



Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

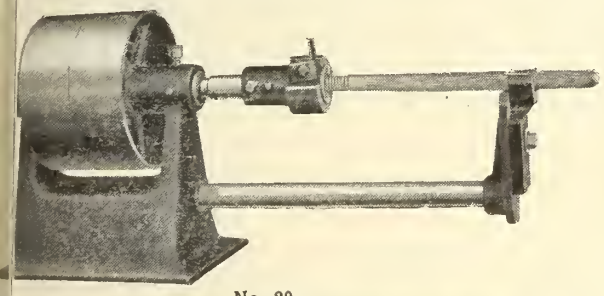
The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely
Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio

Improved Machines for the Woodworking Plant

Rapid Thread Cutting Machine for Wood Work

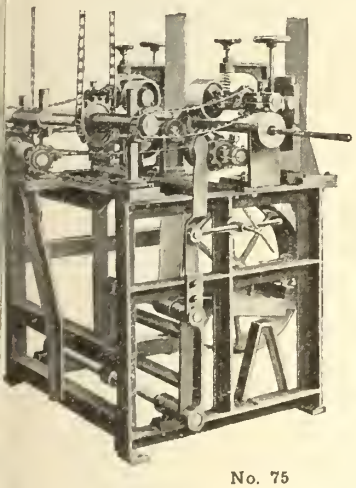


No. 20

This machine will cut threads in wood up to 2-in. diameter ell as all smaller sizes and do the work easily and with great d.

It is used for threading the ends of all kinds of handles such Mop, Broom, Brush, Sweeper and similar work, and will cut n at the rate of from 20 to 30 per minute. Also used for tapping.

The Rapid Automatic Sanding and Buffing Machine



No. 75

It Sands Turned Stock

70 Lineal Feet a Minute with a Finish Like Glass.

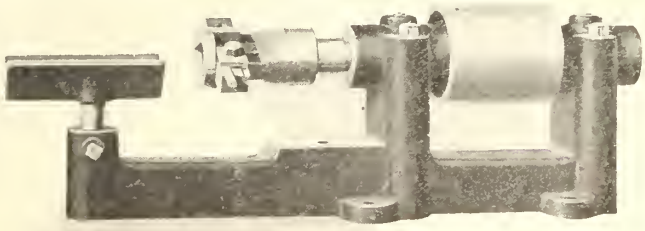
as the immense capacity that insures bed rock cost on all kinds straight and irregular stock from 20-in. long up to any length, from ¼ to 1¾-in. diamettr.

The stock revolves so rapidly that only No. 00 sand cloth need used, producing a surface smooth as glass. And a high-grade sh helps to sell your product.

The Rapid is practically fool proof, and is so easily operated t a boy can run it. In many shops it is replacing other makes sanders.

I am ready to answer questions and prove my claims

Rapid Chucking and Topping Machine

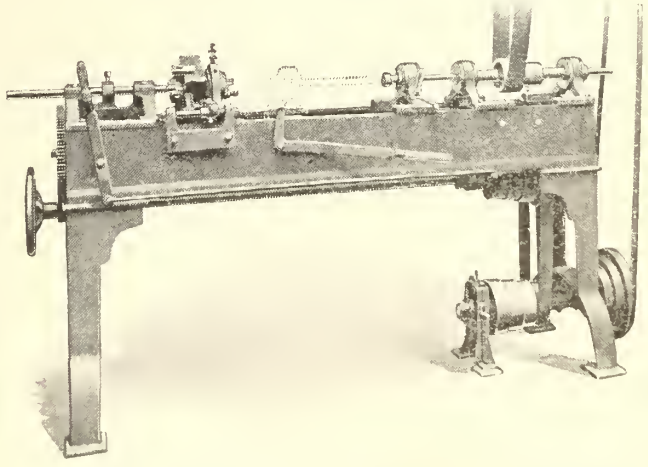


No. 31

Handle as chucked by above machine and ready for threading

Get descriptive matter—and for all kinds of machinery for handle turning, sanding and varnishing, as well as Automatic Machinery for Fancy Turnings.

No. B 42 Automatic Lathe



This improved Lathe is fitted up thruout with S.K.F. Self-aligning Ball Bearings, which do away with all mandrel trouble and effect a saving of 40% in power. The Ball Bearing Eye does away with all friction on the wood after it has been turned round with the roughing knife and for this reason, all kinds of woods can be Turned on the Self-feeder, including hard maple; there is no friction whatever, as the stick is tight in the Ball Bearing and revolves with this Bearing so the stick CANNOT BURN or heat the Bearing.

The No. B 42 Lathe is a Machine that you have long felt the need of and upon request, will be glad to send you descriptive matter and samples of the work done on this improved Machine.

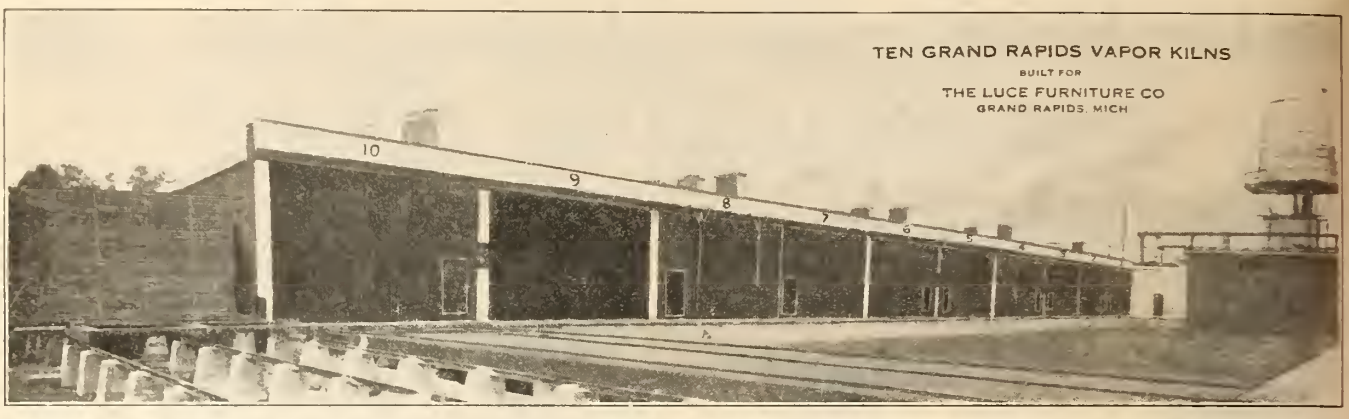
MANUFACTURED BY

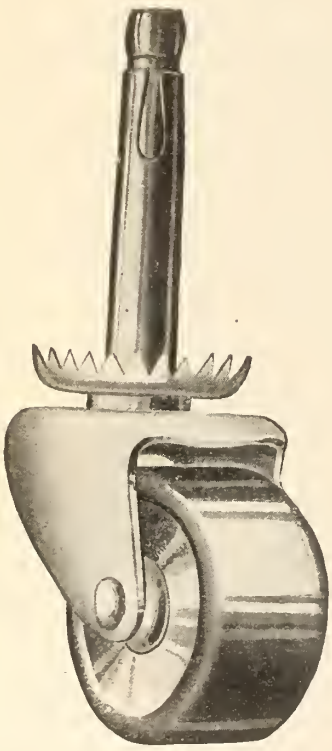
C. W. SMITH, M. E.

LEONARD BLD. - GRAND RAPIDS MICH., U.S.A.

gents:—Oliver Machinery Co., Manchester, England

A. R. Williams Machinery Co., Toronto and Montreal, Canada





Casters and Hardware

National Casters are made in an up-to-date plant in Canada by Canadian workmen—the men who buy your furniture. When you purchase the products of their labor, you in turn enable them to purchase yours.

National Casters are made from the finest materials and the workmanship and finish are first class.

Prices are attractive and deliveries prompt. May we send you full particulars?

National Hardware Co., Limited

Orillia - Ontario

The "Steelgrip"

METHOD IS THE BEST

for making mitered, butt or any other joint

Used by all leading Furniture, Cabinet and Casket Manufacturers.

In using "*Steelgrip*" CLAMP NAILS only the ordinary machine work is required. Cut a slot, drive in a "Steelgrip," that's all. No clamping, no waiting for glue to set.

Avoid Substitutes

"*Steelgrip*" CLAMP NAILS

Save Time + Labor = Money

Produce, Strength + Durability = Better Product

Shipped in cartoons of 1 lb. 5 lbs. and 10 lbs. each Bulk packages 25 lbs., 50 lbs. and 100 lbs. each

CLAMP NAIL COMPANY

4532 PALMER STREET, CHICAGO

CIRCULARS and SAMPLES ON REQUEST.

The Gates of Business Are Opening Wide

The Past

What of the Past? Half-a-Century of Machinery Service, reflecting the highest ideals of business policy and co-operation—ours is an enviable record, linked with that of many well-known Manufacturers and Machinery Houses "Household Names" in the furniture industry.

The Present

What of the Present? The continuance of a policy inspired by the mutual confidence displayed between us and our many friends—a policy the natural corollary of our scientific study of the requirements in Machinery for "Modern Methods," presenting the best

For "Modern Methods" what better machinery than that of:—

CANADA MACHINERY CORPORATION, GALT.
FAY AND EGAN, CINCINNATI.
JAMES L. TAYLOR CO, POUGHKEEPSIE, N.Y.
CHAS. E. FRANCIS CO., RUSHVILLE, IND.
BEACH MFG. CO, MONTROSE, PA.
ALEX. DODDS CO., GRAND RAPIDS, MICH.
THE BELL MACHINE CO,. OSHKOSH, WIS.
VALLEY CITY MACHINE WKS. CO., GRAND RAPIDS, MICH.
C. W. SMITH, GRAND RAPIDS, MICH.
OBER MFG. COMPANY, CHAGRIN FALLS, OHIO.
PAASCHE AIR BRUSH CO., CHICAGO, ILL.

The Future

What of the Future? Our insistance on the best--better machinery, better methods, better co-operation, better service --this justifies our optimism of the Great Future which is on the horizon. The tide is already turning, the Gates of Business are opening wide, we must be out in the limelight with up-to-date methods, scientific production, unfailing application and general co-operation. The Future is within our grasp--now!

If it's Machinery—write "Williams"

Excerpts from a booklet by
The H. K. Ferguson Co., Engineers and Builders

Advertising and Construction

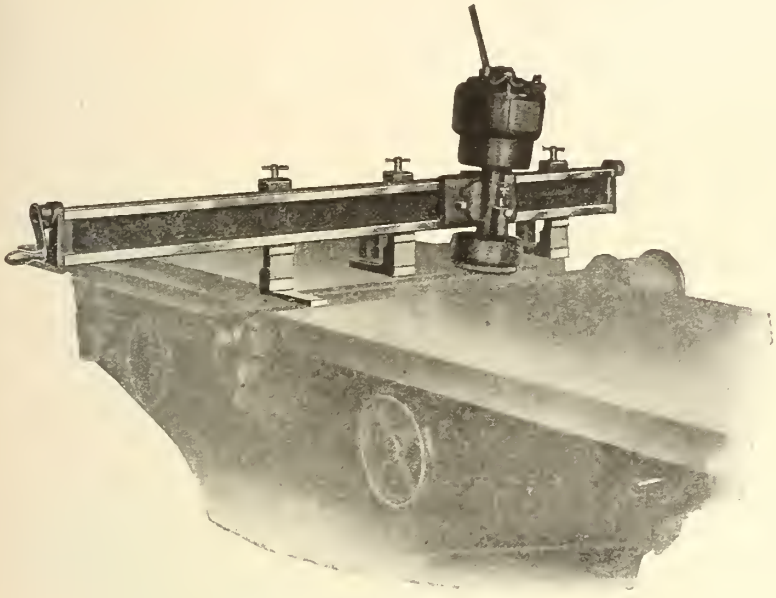
An actual and definite relation between the two

The past twenty-five years, marked by the ever-increasing application of the force called advertising to a wider and wider range of business problems, have, of course, built up a growing fund of general information with regard to the effects of advertising.

We have all recently seen the publication of figures indicating that 84% of all business failures in 1920 were of concerns which failed to advertise. An analysis of the factory-construction records of my own company shows that 83¾% of our customers are advertisers.

Stated differently, the figures indicate that the manufacturer who advertises is five times as likely to stay in business as his non-advertising competitor, and is five times as likely to need more factory space which he will probably buy in two and one-half times the quantity required by the non-advertiser.

QUICSHARP TRADE MARK Grinder



Method of attaching to Jointer

Summarizing some of the Features and Advantages

The knives are always in perfect alignment with the bed and with each other, making each knife do its share of the cutting, thus insuring smooth and accurate.

Machines will take care of from 25 to 40 per cent. more work than with the file and oil stone method, and with a reduction of one-half in the cost of knives.

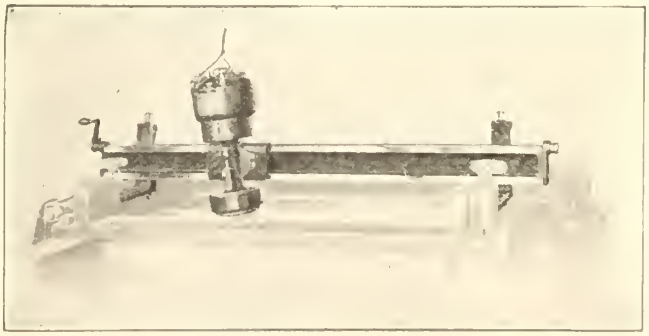
Harder knives can be used than is possible with the old method of whetting knives with a file and oil stone.

With cylindrical head planers the knives are so thin and flexible that it is difficult to grind them on an automatic and put them back on the machine in perfect alignment. A great deal of time is used up adjusting knives. With the Quicsharp Grinder, knives are ground to a keen edge right on the machine in ten to fifteen minutes. The tilted head grinds knives slightly concaved, giving a stronger and freer cutting edge; this, not only means more work, but a tremendous saving in power consumed. With a Quicsharp Grinder in the shop there is no excuse for idle machines. If a nail or gravel stone is run into, usually, instead of having to take off the knives and adjust a new pair, a few minutes with the grinder will clean up the gap and work started again without any serious delay.

A pair of knives once put on a machine are not usually taken off until worn out.

The constant pressure tension spring holds grinding wheel against knife with a uniform pressure and prevents all possibility of burning of knives.

If one man takes charge of the grinding of knives, using Grinder once a day, knives will be in better shape than the most expert operator could keep them. The care and adjustment of knives is the most important part in the operation of planers. This inexpensive grinder does all that the costly automatic does, and much more. It occupies no floor space, gets its power from a lamp socket, is simple and durable.



Method of attaching to planer

It will save its cost many times over

Stockbridge Machine Co., Worcester, Mass., U.S.A.

Canadian Distributors:

The Preston Woodworking Machinery Co., Ltd., Preston, Ont., Canada

WORKS LIKE A CHARM

the new

GLUE SPREADER

IN actual performance this new Plate Joint Glue Spreader has proved that it can more than double the production of Clamping equipment.

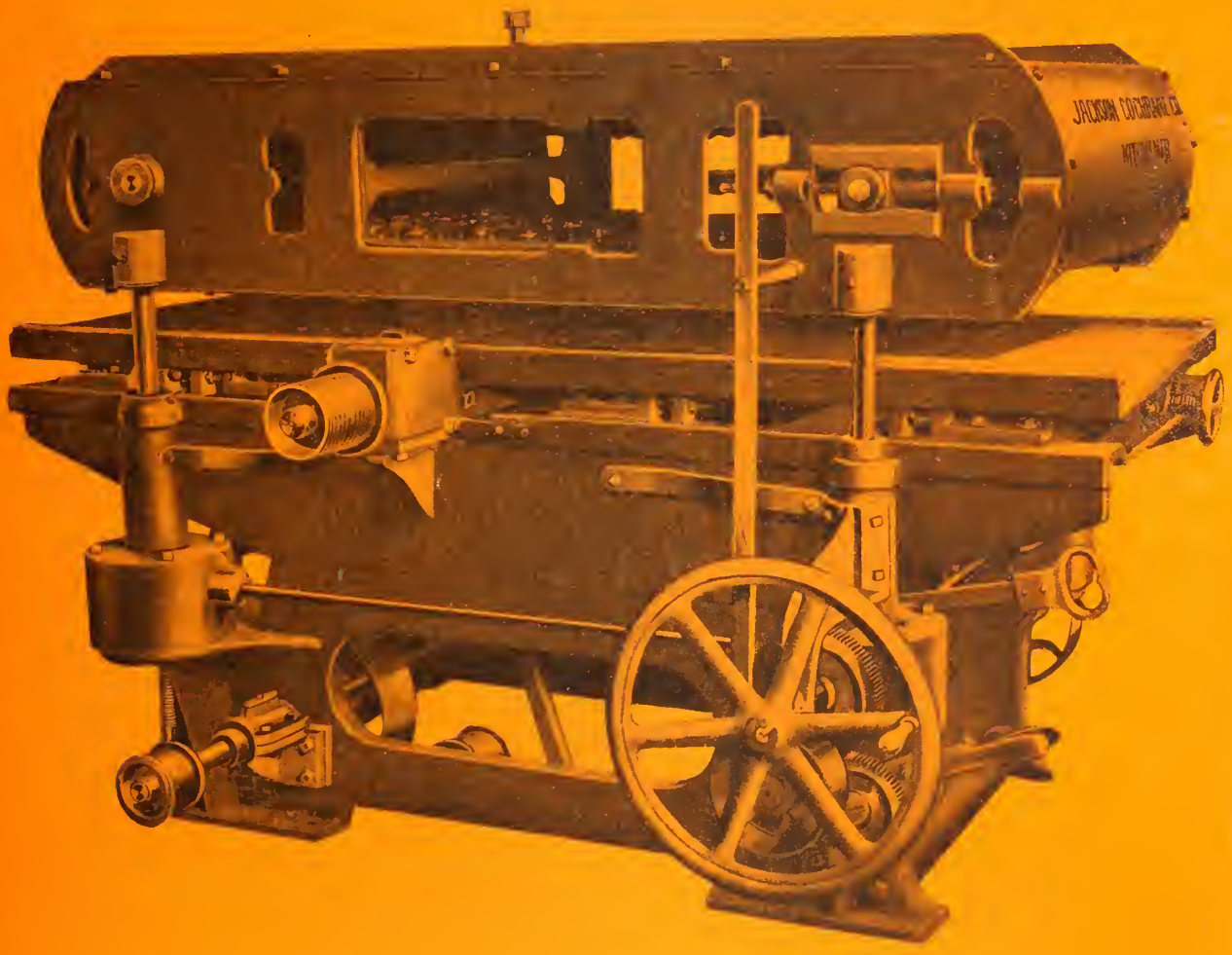
The operator presses the foot lever down, raising the perforated plate up out of the glue. Then by resting the edges of the stock on the plate and moving them backward or forward slightly, the edge will be evenly coated with the required thickness of glue. The release of the foot lever allows the plate to sink back to be impregnated for the next batch of stock. The tank is 5 inches wide and 5 inches deep. Perforated plate is 4 inches wide, $\frac{3}{8}$ inches thick and 1 inch shorter than tank. Self Acting steel cover supplied to order.

Size Floor	Space	Weight
5′ 11″	7′ x 2′	700
7′ 11″	9′ x 2′	800

Jackson, Cochrane & Company

KITCHENER - CANADA

"HERZOG" SELF-FEED JOINTER



Two Boys Could Operate this Jointer for You

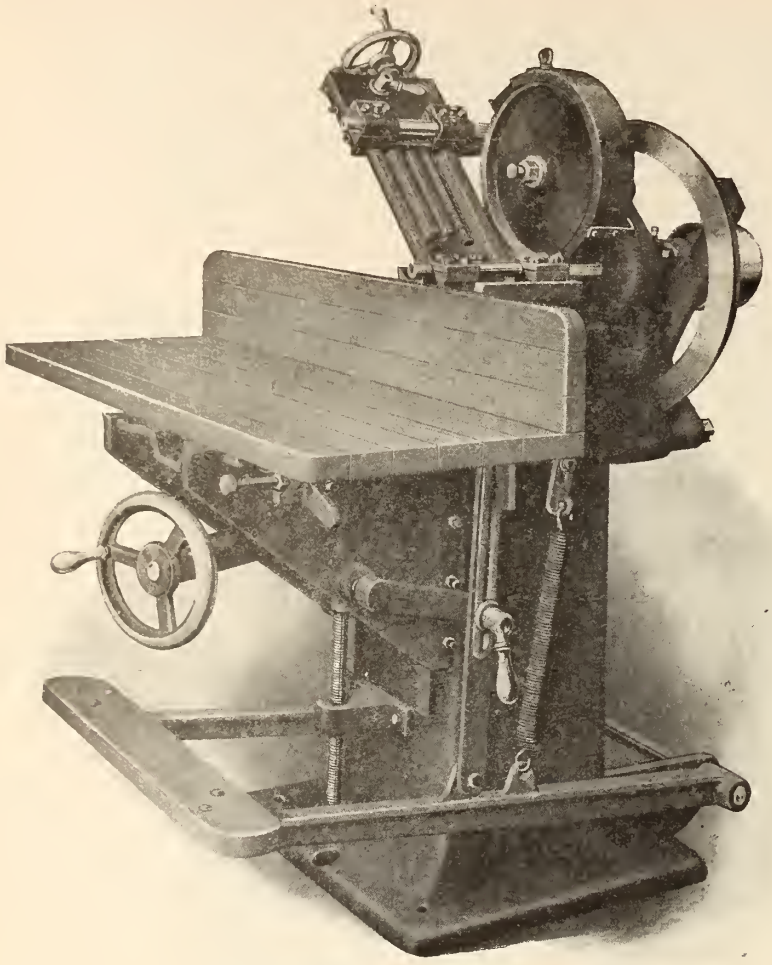
Think what a saving that would effect in your shop—two boys doing the work—better—and from three to five times faster than hand jointers. Such efficiency is made possible by the many splendid qualities the machine possesses, its simplicity of operation, its ruggedness of construction and its ability to work at high pressure without frequent breakdowns.

The Herzog Self-Feed Jointer handles stock varying in width from 1 inch to the full width of the machine. It will operate at fast or slow speeds while the knives require about one-fifth the attention given hand jointers.

We would like to send you full particulars and prices. May we?

Jackson, Cochrane & Company

KITCHENER - CANADA

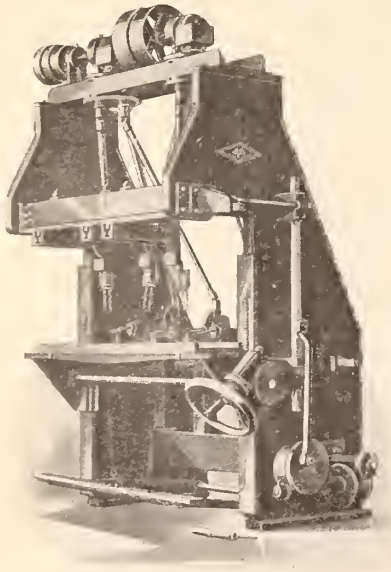


Double Spindle Radial Boring Machines
Built in two sizes
No. 1—To bore from 1¼" minimum to 18" maximum centers.
No. 2—To bore from 1 " minumum to 12" maximum centers.

Valley City Boring Machines

Lead The Way

This is the standard of the furniture manufacturing world. The machine is finished with accuracy and combines versatility with never failing reliability. The TABLE is actuated with a central connecting rod—preventing the bureau drawer effect. The large INTERMEDIATE GEAR is supported at any position by the large segment on the rear of the column—the machine has a backbone—eliminating the vibrations set up by the action of the teeth and prolonging the life of the spindles.



Double Direction Boring Machine

A new CLOSE CENTER ATTACHMENT has recently been perfected which is universal and will bore two 5/16" holes anywhere in a circle of 1¼" with minimum centres of ½".

The new QUICK ACTION CLAMP attached to the fence eliminates the old stick.

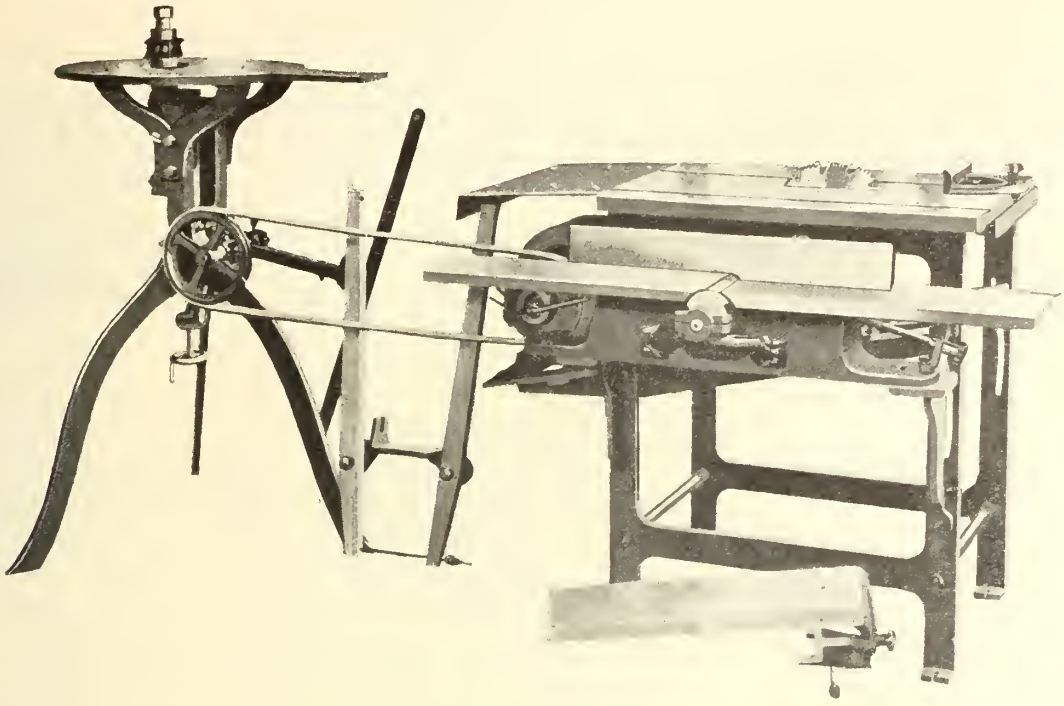
The New Double Direction Borer

was created to take care of the needs especially of the Chair Manufacturer. It bores horizontally and vertically and at ANGLES. Feeds are independent and selective. Remember we can bore all the holes you have in any piece with one operation if you want to

Canadian Representatives:
THE A. R. WILLIAMS MACHINERY CO., LIMITED
Toronto Montreal St. John Winnipeg Vancouver Halifax

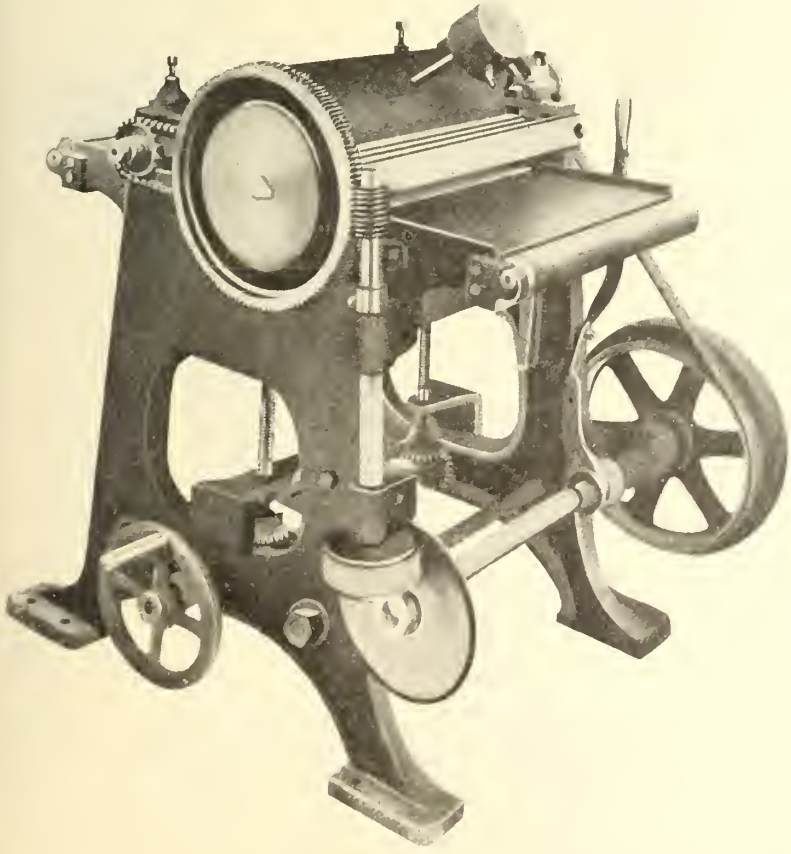
Valley City Machine Works

Campau Avenue and Fulton St. N.W. Grand Rapids, Michigan, U. S. A.



Our New No. 7 Woodworker

A compact, reliable machine that is particularly adapted for shop or factory use.
Our Combination Scroll Saw & Shaper can be run from the same Motor.
Motor supplied, if required, to run from lamp socket.
Notice the Jointer is on the front of machine so the operator does not change his position to rip or joint.
Put this machine in your bench room and save time running to the big machines.



The Elliott Bull Dog Planer

6″ x 16″

The facts that the head is run by a worm gear; no pinions on the head and that the feed rolls are driven independent of the head excludes vibration. Hence—it planes smoother than any other Pony Planer made. Also it uses less power.

Write for Prices and Catalogue

Elliott Machinery Co.

Limited

Belleville, - - - Ontario

CANADA

Upholstered Furniture Manufacturers Attention!

The Construction

of our

Ball Foot

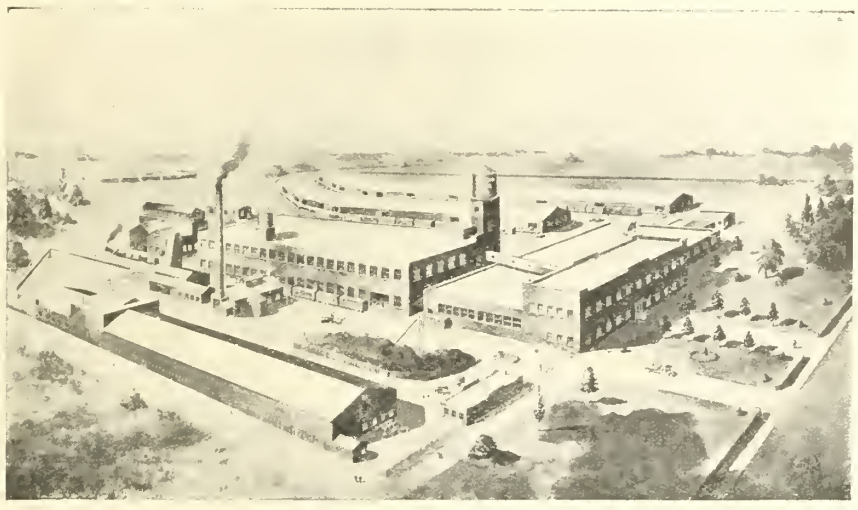
is consistent with the demands of the heaviest Chesterfield.

They will stand the roughest usage, and will add to the attractiveness of your goods. Last but not least they are reasonable in price.

J. WALTER & SONS LIMITED

KITCHENER :-: ONTARIO

PERKINS
183
(Trade Mark)
g. U.S. Pat. Off.



General Offices and Factory

The Glue of Dependability

PERKINS QUALITY and PERKINS SERVICE

Builders of plywood who are not familiar with our product can profit by investigating its merits and learning the value of a quality product that gives general satisfaction, and a service that makes for efficient glue room practice as well as prompt shipments.

Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy, and other foreign countries.

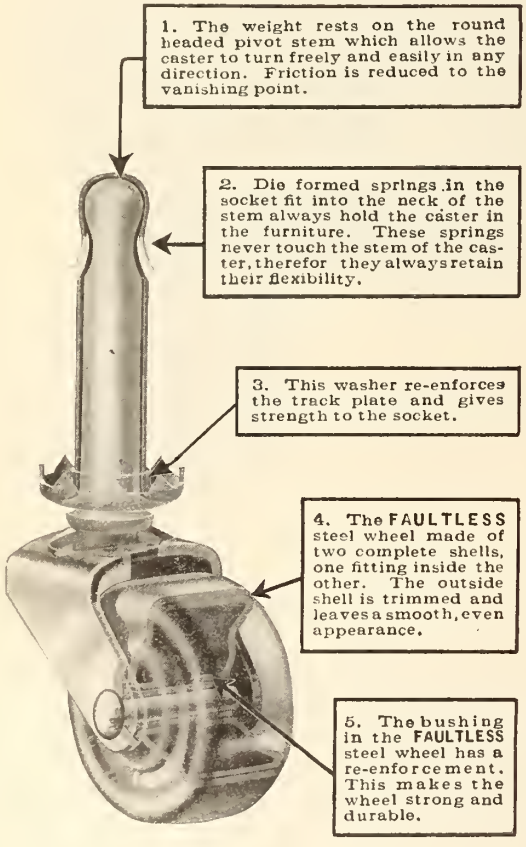
PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office:
South Bend, Indiana

Noelting

FAULTLESS CASTERS

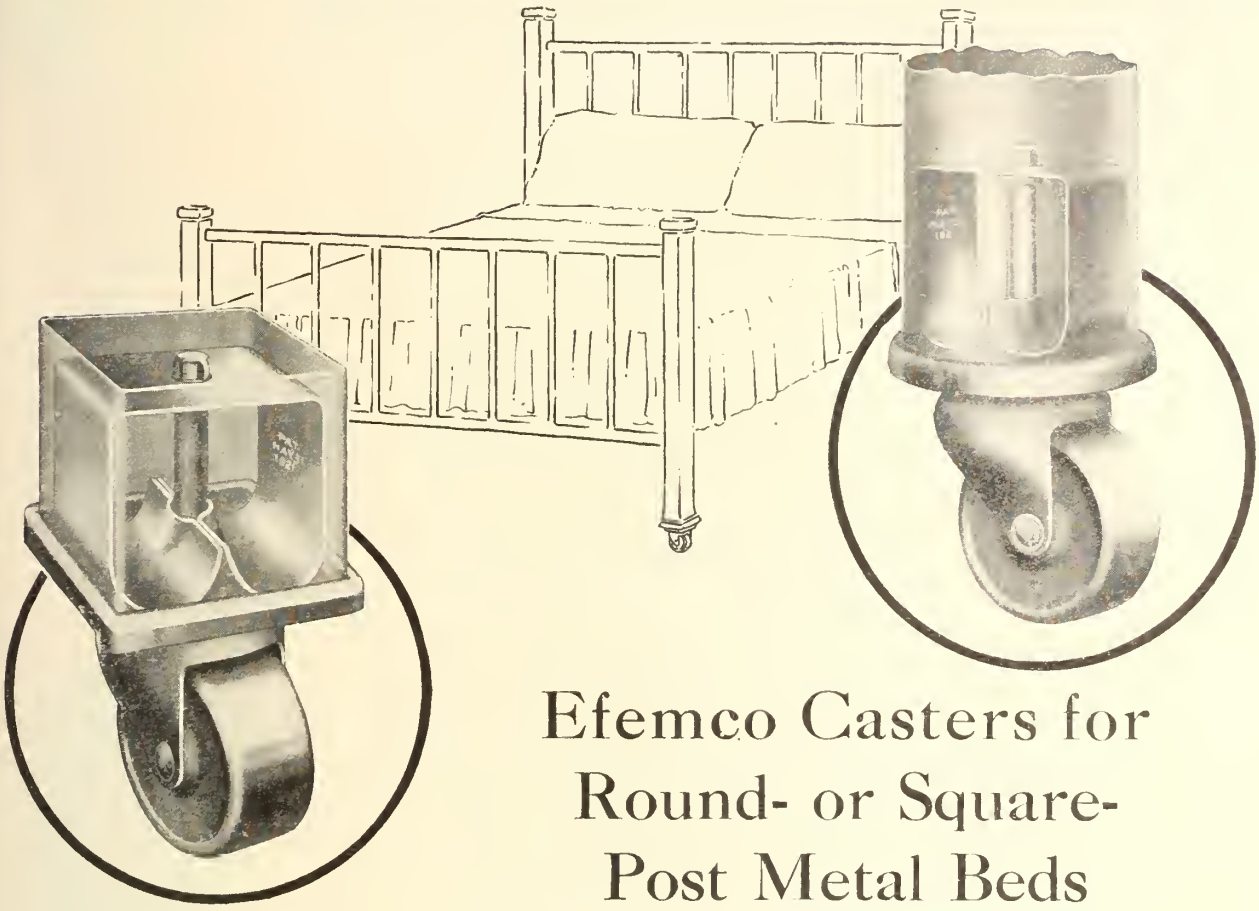

1. The weight rests on the round headed pivot stem which allows the caster to turn freely and easily in any direction. Friction is reduced to the vanishing point.
2. Die formed springs in the socket fit into the neck of the stem always hold the caster in the furniture. These springs never touch the stem of the caster, therefor they always retain their flexibility.
3. This washer re-enforces the track plate and gives strength to the socket.
4. The FAULTLESS steel wheel made of two complete shells, one fitting inside the other. The outside shell is trimmed and leaves a smooth, even appearance.
5. The bushing in the FAULTLESS steel wheel has a re-enforcement. This makes the wheel strong and durable.

Swivel easily and quickly—rolls at a touch. Their simple construction is most pleasing, their smart design is most appealing and enhances the beauty of your furniture.

Faultless Caster Company

Executive Offices Evansville, Indiana

Mfgs. of Pivot Bearing, Roller Bearing, Ball Bearing, Grip Neck and Metallic Bedstead Casters.



Efemco Casters for Round- or Square-Post Metal Beds

So constructed as to be rigid in either round or square posts. The strong, flat spring with four point contact as shown in the illustrations is responsible for that. Made for all sizes of posts and in both plain and ball bearing types, and furnished in maple, lignum vitae, steel, iron or fibre wheels.

Send to-day for complete catalog of Efemco *Casters*

Standardized by 57 years of service.

FOSTER, MERRIAM & CO.

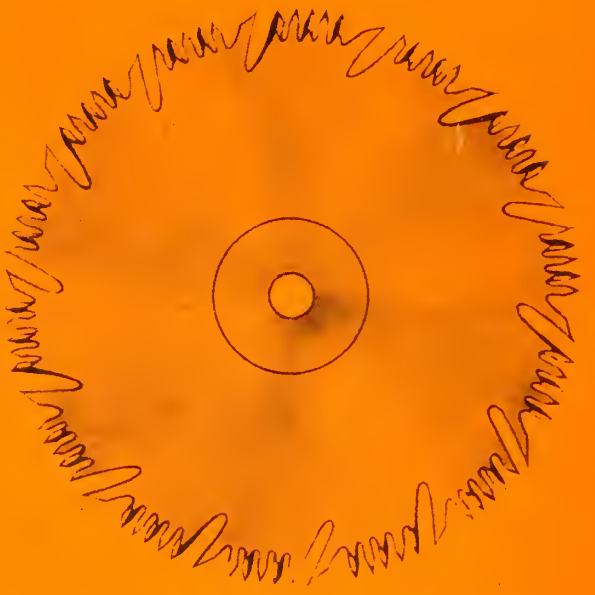
Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters
Roller Bearing Casters
Truck Casters
Automobile Accessories
Piston Rings
Grey Iron Castings

RADCLIFF SAWS

Saw Tools,
Machine Knives,
Hoe Shanks,
and Bits,
Emery Wheels,
Shafting,
Belting,
Files, Hangers
and Filing Room
Machinery.



REPAIRS

Be sure that name of owner appears on each saw, and mail full instructions of work to be done, stating the hand, speed, and feed of mill together with shipping directions for return of saws.

THE Radcliff guarantee provides full protection to the purchaser of "Beaver Brand" Saws and is some indication of the pains taken in their manufacture in order to live up to the guarantee. These saws are made from the finest grade Crucible Steel—keen cutting and strong. They retain their tension and cutting edge longer than any others.

Let us send you the Radcliff catalog and price list containing just the information you want.

Radcliff Saw Manufacturing Company, Limited

1550 Dundas Street West, Toronto, Ontario

Agents for L. & I. J. White Company Machine Knives

IN 1890 C. L. Willey founded at Chicago what soon grew to be the largest veneer manufacturing establishment in the world. The company was launched on the platform of unvarying quality, a policy from which it has never deviated. Due to the death of C. L. Willey, five years ago, and the subsequent death of his son, Charles B. Willey, the present organization was effected last spring for the purpose of sustaining the business on its plane of acknowledged supremacy, and keeping intact Mr. Willey's traditions of sound, clean business practice. The fame of C.L. Willey as the largest manufacturer of fine veneers in the world finds expression to-day in the institution he founded and will permanently endure through the active administration of that institution under the Willey name.

The extensive and perfectly balanced battery of highly efficient veneer-cutting and drying equipment will function as always. The warehouses will continue to exhibit that scrupulous orderliness and cleanliness which have always made Willey veneers notable for their bright and undamaged appearance. The exceptional facilities for handling and caring for orders that so greatly contributed to the Willey prestige will be maintained and extended. The extensive log organization, which became famous under Mr. Willey's tutelage, will continue.

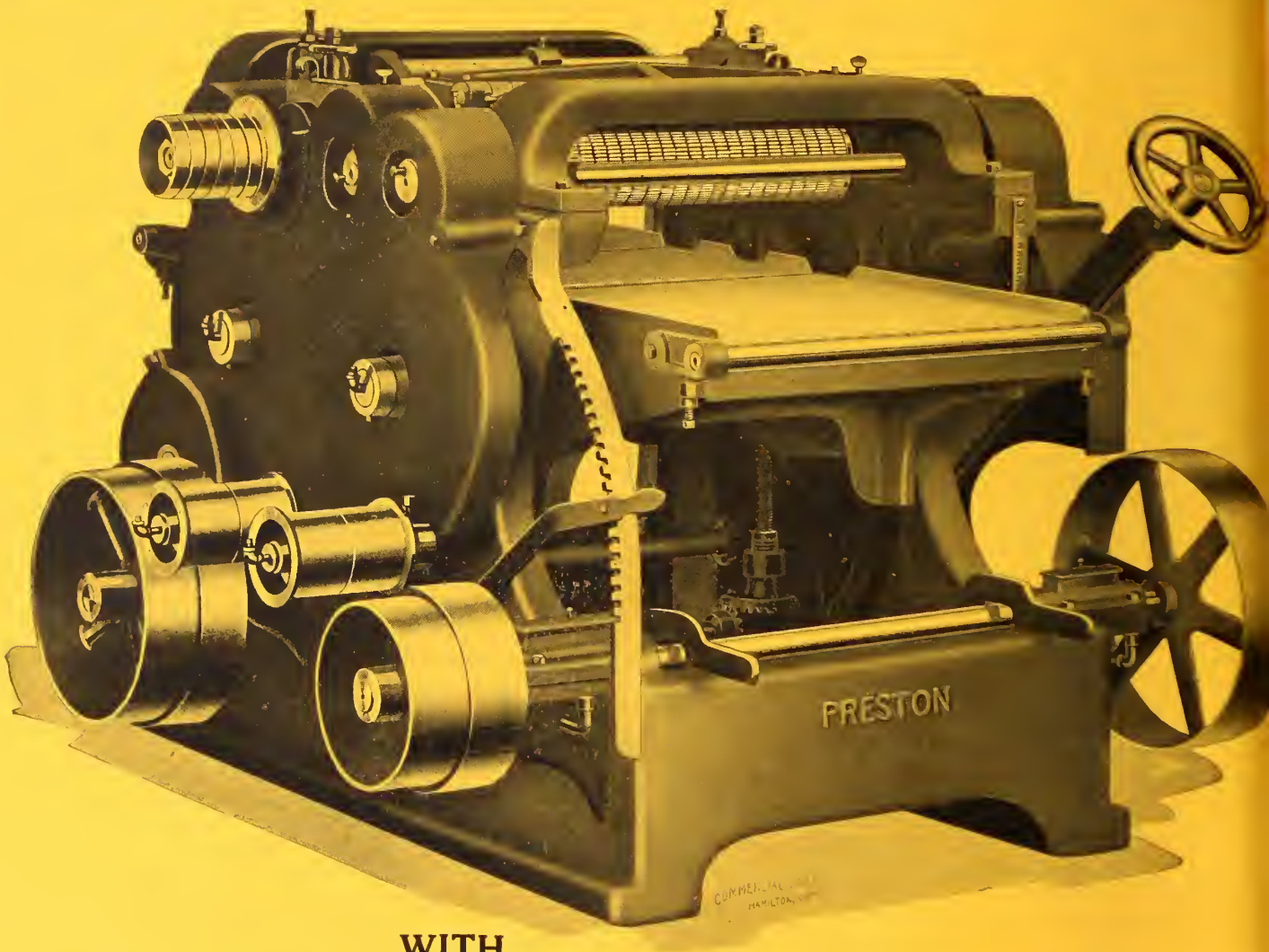
The C. L. Willey Company is a going concern, financially sound, with a thoroughiy organized sales force and experienced artisans trained in its factory, and will continue to turn out an exceptional quality product in hardwood veneers and lumber from walnut, mahogany, circassian, quartered oak, English oak, poplar, satinwood, vermillion, teak, rosewood and other foreign and domestic species.

The plant is located at 2558 S. Robey Street Chicago, and is splendidly served by the C. B. & Q. railroad and in addition by its own slip on the south fork of the Chicago river, an ideal combination for both rail and water transportation.

THE C. L. WILLEY COMPANY
CHICAGO

Branch Offices:
Grand Rapids Jamestown New York

No. 123 "Preston" High Speed Ball Bearing Surface Planer



WITH

(1) Specially selected S.K.F. Ball Bearings (2) Sectional Roll and Sectional Chipbreake
(3) Round Cylinder with 4 High Speed Knives (4) Stockbridge Knife Grinder and Jointer
(5) Cylinder Speed, 5000 r.p.m.

IT WILL:—(1) Reduce Your Sanding Costs! and (2) Increase Your Production

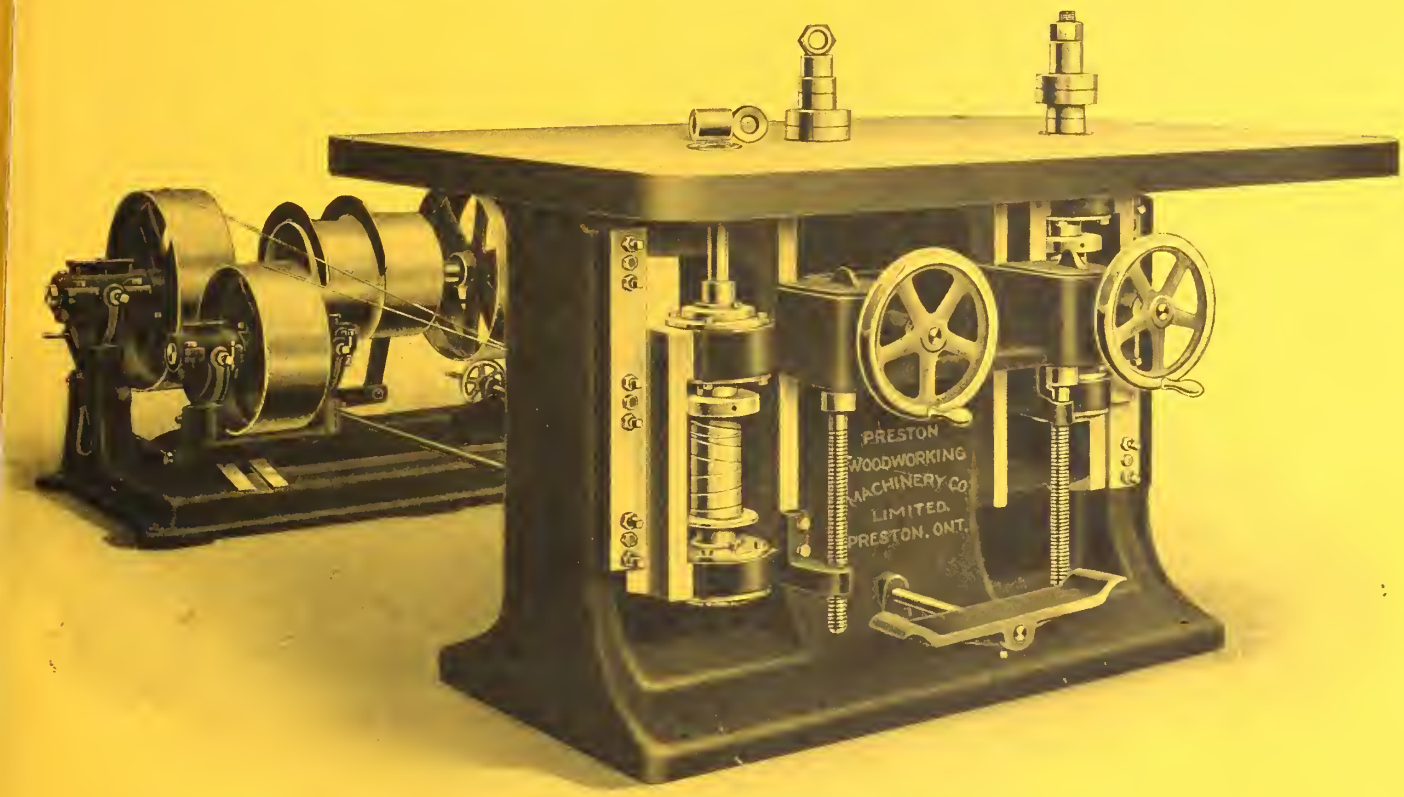
WE GUARANTEE THESE TWO POINTS. Your planing will not only be done much more quick but it will be done so much better that a very great percentage of your sanding will be eliminated. Let's prove to you h quickly it will pay for itself. Competition is keen and it will surely reduce your production costs and help you in the ra

The Preston Woodworking

PRESTON,

We are Sole Manufacturers of and Agents in Canada for the Eaglesfield Patented Beltless Swing Saw.

o. 162 "Preston" High Speed Ball Bearing Shaper



Built either Single or Double Spindle

Do You Know This Machine?

It will do

100% More Work* and *100% Better Work

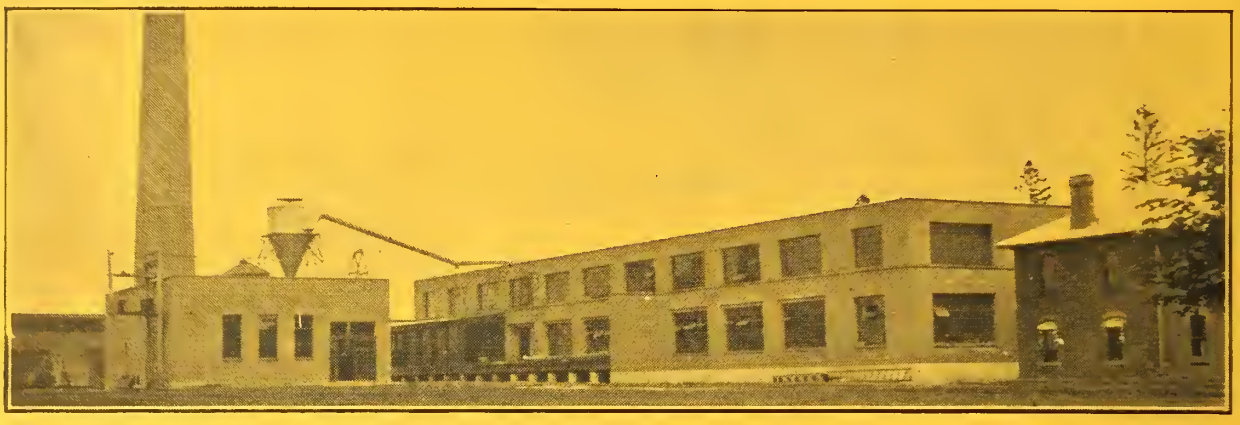
than your old shaper.

WE CAN PROVE IT

Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

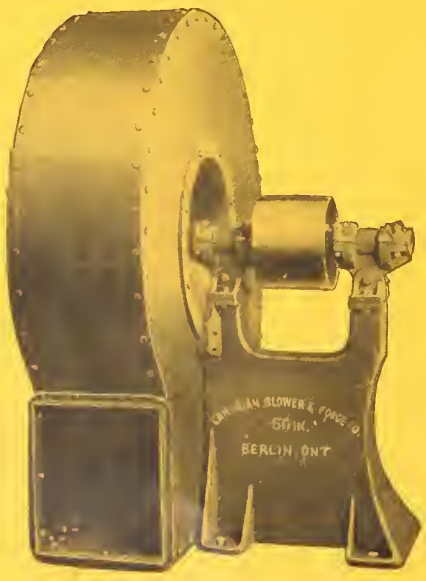


General view of office, plant and power house, Langslow, Limited, Cobourg, Ont.

"Modern Methods"

as applied by

Langslow Limited



IN the erection of this large modern, daylight furniture manufacturing plant nothing was overlooked that would reduce production costs and improve the quality of the work.

They were not satisfied with any kind of a shaving exhaust system, but secured the services of our experienced engineers who make a specialty of this work.

The result is a system which is not only efficient as far as removal of the refuse is concerned, but requires a minimum amount of power to operate.

When another building was added and a second system wanted, it was but natural that we should get the job, which is now being erected.

Our slow speed fans will save you money and our engineers are ready to give your plant the same advantages. Why not write us for full particulars?

Ask for Catalog 410-13

Canadian Blower & Forge Co.

Limited

KITCHENER - - - ONTARIO

Made of Canadian Birch

Supplied by Edward Clark & Sons, Ltd.

THIS splendid example of Canadian craftsmanship from the shops of John C. Mundel and Company, Elora, Ont. gives a good idea of the type of wood we manufacture and supply to many of the leading Furniture Manufacturers in Canada and the United States.

As the mills are not sawing the quantity of Hardwood lumber this year that they have been accustomed to manufacture in the past, we strongly advise you to place your order at the present prevailing prices which we firmly believe are the absolute rock bottom. A very good plan is to place an order for your requirements for the next six months, giving instructions as to the various shipping dates. This policy is being followed by the larger manufacturers.

Efficiency Courtesy and Service.

Edward Clark & Sons, Limited

807-9 Bank of Hamilton Bldg. Toronto

Anderson, Shreiner & Mawson

Phone Main 1604 43 Victoria St., TORONTO

Lumber Manufacturers and Wholesalers

Birch, Maple, Elm, Ash and Basswood

Write or "Phone" for Prices **Mills at South River, Ont.**

H. J. RICHARDS J. T. KENDALL

Richards Hardwood Company

746-7 BANK OF COMMERCE BUILDING

Memphis, Tennessee, U. S. A.

Successors to Dacus-Richards Hardwood Co.

We make a specialty of catering to the Canadian trade and are in position to make reasonably prompt shipment of practically any Southern Hardwoods which you are needing. Your orders and inquiries will be highly appreciated and will receive our prompt and personal attention.

Specializing in Delta Red and Sapgum, Oak, Elm and Poplar.

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.—58,000
1¼ in.— 3,500
1½ in.—

CHERRY

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
1 in.	44,500	.....	203,900	18,500
1¼ in	4,900	.....	37,600	7,500
1½ in.	2,000	.....	34,700	36,300
2 in.	6,000	.....	22,200	61,900
2½ in.	5,500	.....	4,300	2,200
3 in.	25,700	.....	6,500	3,300
4 in.	4,000	.....	900	400

CHESTNUT

	1 & 2	Clear Strips.	No. 1 Com.	S.W. & No. 2 Com.
¾ in.	500	.....	56,000	91,000
1 in.	11,000	500	45,000	1,000
1¼ in.	66,800	300	100,200	159,200
1½ in.	34,500	.....	40,000	.....
2 in.	2,200	.....	15,300	89,200
2½ in.	4,000	.....	1,500	.....
3 in.	1,100	.....	1,000	500
4 in.	1,500	.....	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
½ in.	6,500	.....	.....	.....
¾ in.	900	300	23,600	9,000
⅝ in.	2,800	.....	5,500	800
1 in.	17,300	10,000	52,400	27,000
1¼ in.	5,000	.....	6,000	.....
1½ in.	600	.....	2,400	.....
2 in.	.....	.....	25,100	5,700
2½ in.	2,000	.....	400	.....
3 in.	2,000	.....	1,300	.....
4 in.	2,500	.....	1,700	.....

PLAIN WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	1,000	.....	.....	.....
½ in.	100	.....	.....	.....
⅝ in.	2,150	.....	8,000	16,900
¾ in.	274,800	.....	453,800	122,000
1 in.	42,300	1,700	78,000	85,200
1¼ in.	6,300	.....	15,100	.....
1½ in.	51,300	.....	84,000	12,000
2 in.	29,000	.....	125,000	54,000
2½ in.	152,800	.....	69,500	3,000
3 in.	55,800	.....	75,800	14,400
3½ in.	4,500	.....	4,000	1,500
4 in.	65,000	.....	38,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	24,200	.....	.....	.....
¾ in.	170,000	.....	327,000	65,800
⅝ in.	2,400	.....	77,000	42,600
1 in.	30,200	3,150	56,000	125,400
1¼ in.	11,700	2,400	16,600	.....
1½ in.	138,900	4,300	46,200	32,000
2 in.	91,500	.....	162,000	71,000
2½ in.	70,100	.....	26,000	3,700
3 in.	23,800	.....	20,500	7,000
4 in.	16,600	.....	10,900	.....

QUARTERED RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
¾ in.	1,700	.....	9,700	500
1 in.	10,200	5,400	7,500	1,400
1¼ in.	2,000	.....	.....	.....
1½ in.	.....	.....	.....	.....
2 in.	.....	.....	7,400	.....

SAP GUM

	1 & 2	Strips.	No. 1 Com.	No. 2 Com.
1 in.	.....	16,000	21,000	.....
1¼ in.	.....	.....	.....	.....
1½ in.	.....	2,400	6,000	13,500
2 in.	.....	.....	5,700	10,400
2½ in.	.....	.....	.....	.....

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	20,000	9,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

		No. 1	No. 2
1	in.	16,300	10,900	9,500
1¼	in.	6'000	8,325	.....
1½	in.	12,000	13,300	9,500
2	in.	9,000	3,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	2,000	6,000	7,000
5/4	9,400	10,800	.....
6/4	8,900	5,500	4,600
8/4	1,300	19,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No.2 Com.
⅝ in.	18,000	15,800	31,300	800
1 in.	27,000	5,200	91,900	.....
1¼ in.	22,300	360	5,700	6,000
1½ in.	19,100	13,000	29,000	7,500
2 in.	15,000	.....	10,500	24,500
2½ in.	10,800	6,000	.....	.....
3 in.	17,900	.....	11,400	47,000
4 in.	6,500	.....	300	450

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

Southern White Ash

Sel. & Bet.,	4/4 in., 6-9 in., 8/10 ft., dry.	50,000 ft.
"	4/4 in., 6-9 in., 8/16 ft., dry.	47,000 ft.
"	4/4 in., 6-7 in., 8/16 ft., dry.	11,500 ft.
"	5/4 in., 6-9 in., 8/16 ft., dry.	40,000 ft.
"	6/4 in., 6-9 in., 8/16 ft., dry.	55,000 ft.
"	8/4 in., 6-9 in., 8/16 ft., dry.	155,000 ft.
"	10/4 in., 6 in. up, 8/16 ft., dry.	56,000 ft.
"	12/4 in., 6 in. up, 8/16 ft., dry.	95,000 ft.
"	16/4 in., 6 in. up, 8/16 ft., dry.	35,000 ft.
"	4/4 in., 10-12 in., 8/16 ft., dry.	15,000 ft.
"	5/4 in., 10-12 in., 8/16 ft., dry.	9,500 ft.
"	6/4 in., 10-12 in., 8/16 ft., dry.	8,000 ft.
"	8/4 in., 10-12 in., 8/16 ft., dry.	32,000 ft.
"	4/4 in., 12 in. up, 8/16 ft., dry.	15,000 ft.
"	5/4 in., 12 in. up, 8/16 ft., dry.	8,000 ft.
"	6/4 in., 12 in. up, 8/16 ft., dry.	5,500 ft.
"	8/4 in., 12 in. up, 8/16 ft., dry.	15,500 ft.
Sel. & Bet.,	12/4 in., 12 in. up, 8/16 ft., dry	9,000 ft.
"	16/4 in., 12 in. up, 8/16 ft., dry	1,800 ft.
Clear	4/4-8/4 in., 2½-5½ in., strips.	16,000 ft.
No. 1 Com.,	4/4 in., 6 in. up, reg.	12,000 ft
"	4/4 in., 3 in. up, reg.	75,000 ft.
"	5/4 in., 3 in. up, reg.	14,000 ft.
"	6/4 in., 3 in. up, reg.	27,500 ft.
"	8/4 in., 3 in. up, reg.	55,000 ft.
"	10/4 in., 3 in. up, reg.	8,700 ft.
"	12/4 in., 3 in. up, reg.	9,000 ft.
No. 2 Com.,	4/4 in., 3 in. up, reg.	20,000 ft.
"	5/4 in., 3 in. up, reg.	42,000 ft.
"	6/4 in., 3 in. up, reg.	34,000 ft.
"	8/4 in., 3 in. up, reg.	42,000 ft.
"	10/4 in., 3 in. up, reg.	13,100 ft.
"	12/4 in., 3 in up, reg.	4,500 ft.
"	16/4 in., 3 in. up, reg.	2,000 ft.

Delivered prices gladly quoted upon request

Dudley Lumber Company Inc.

Yards: Memphis, New Orleans. Main Office: Memphis, Tenn.

British Columbia Lumber Commissioner

Display rooms and offices have been removed to 51 YONGE STREET (Ground floor)

where a complete display of British Columbia forest products will be installed, including several rooms to full scale, finished in BRITISH COLUMBIA WOODS and completely furnished, showing exterior walls and roof of British Columbia red cedar with thatched roof effect. Also, a complete display of every grade of all British Columbia woods in commercial sizes and a complete line of British Columbia boxes and RED CEDAR SHINGLES.

You are cordially invited to call and see our exhibit.

Main 6872 TORONTO 51 Yonge St.

We wish to announce that we have acquired yard at 6th & A. Streets Louisville, Ky., formerly operated by the Edward L. Davis Lumber Co., together with all stock on hand.

We will have facilities for taking care of 2 Million feet of Hardwoods, dressing, Kiln-drying and resawing stock. We will do a general rehandling and assorting business specializing on straight and mixed cars of Ash, Chestnut, Oak, Poplar and other hardwoods.

R. R. May Hardwood Co.

6th & A Streets Louisville, Ky.,

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

DRY STOCK

For Immediate Shipment

	SOFT ELM			SOFT MAPLE	
6905′	1″	—No. 1 C&B	14397′	2½″	—No. 1 C&B
3195′	1″	—No. 2 Com.		BASSWOOD	
41030′	1½″	—No. 1 C&B	1549′	1″	—No. 1 C&B
2356′	1½″	—No. 2 Com.	606′	2″	—No. 1 C&B
56880′	2″	—No. 1 C&B		BUTTERNUT	
10046′	2″	—No. 2 Com.	2584′	1″	—No. 1 C&B
110594′	2½″	—No. 1 C&B		HARD MAPLE	
26985′	2½″	—No. 2 Com.	31788′	1″	—No. 1 C&B
11750′	3″	—No. 2 Com.	243927′	1¼″	—No. 1 C&B
	WHITE ASH		227707′	1½″	—No. 1 C&B
87846′	2″	—No. 1 C&B	1796′	1½″	—No. 2 Com.
3072′	2″	—No. 2 Com.	217401′	2″	—No. 1 C&B
139960′	2½″	—No. 1 C&B	11410′	2″	—No. 2 Com.
13537′	2½″	—No. 2 Com.	38016′	2½″	—No. 1 C&B
18992′	3″	—No. 1 C&B	11091′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.	2796′	4″	—No. 1 C&B
	HICKORY			BEECH	
650′	1″	—No. 1 C&B	3000′	1½″	—No. 2 Com
1408′	2″	—No. 1 C&B	500′	2″	—Log run
	COTTONWOOD		250′	2½″	—Log run
1620′	1″	—No. 1 C&B	350′	3″	—Log Run
19956′	2″	—No. 1 C&B	100′	4″	—Log run
1196′	2″	—No. 2 Com.		BIRCH	
	BLACK WALNUT		15998′	1″	—No. 1 C&B
2873′	1″	—No. 1 C&B	22311′	1¼″	—No. 1 C&B
1151′	1″	—No. 2 Com.	11748′	1½″	—No. 1 C&B
	WILLOW		50157′	2″	—No. 1 C&B
1446′	1″	—No. 1 C&B	87172′	2½″	—No. 1 C&B
	CHERRY		7866′	3″	—No. 1 C&B
4747′	1″	—No. 1 C&B		PLAIN OAK	
2137′	1″	—No. 2 Com.	9369′	1″	—No. 1 C&B
	ROCK ELM		1107′	2″	—No. 1 C&B
12493′	2″	—No. 1 C&B			

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft.....8/4 No. 1 Com.

Band-mills at Baton Rouge, La., Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

Miller Lumber Company

Marianna - Arkansas

QUARTERED WHITE OAK
300,000′ 4/4 No. 1 Com.
20,000′ 5/4 No. 1 Com.
8,000′ 8/4 No. 1 Com.
150,000′ 4/4 No. 2 Com.
2,000′ 5/4 No. 2 Com.

PLAIN WHITE OAK
70,000′ 4/4 FAS
13,500′ 5/4 FAS
300,000′ 4/4 No. 1 Com.
42,000′ 6/4 No. 1 Com.
35,000′ 8/4 No. 1 Com.
300,000′ 4/4 No. 2 Com.
11,500′ 5/4 No. 2 Com.
10,500′ 6/4 No. 2 Com.
20,000′ 8/4 No. 2

QUARTERED RED OAK
3,200′ 3/4 C & Btr.
150,000′ 4/4 Nos. 1 & 2 Com.
1,000′ 5/4 No. 2 C & Btr.
3,500′ 8/4 No. 2 C & Btr.

PLAIN RED OAK
75,000′ 4/4 FAS
13,500′ 5/4 FAS
5,000′ 8/4 FAS
600,000′ 4/4 No. 1 Com.
33,000′ 5/4 No. 1 Com.
11,000′ 6/4 No. 1 Com.
48,000′ 8/4 No. 1 Com.
600,000′ 4/4 No. 2 Com.
9,400′ 5/4 No. 2 Com.
3,000′ 8/4 No. 2 Com.

MISCELLANEOUS OAK
3,700′ 3/4 No. 2 C & B Qt. W. O.
5,000′ 4/4 Cl. Pl. RO Stps 3-5 1/2″
8,500′ 4/4 Cl. Pl. WO Stps 3-5 1/2″
7,300′ 5/4 Pl. RO Step Plk. 11″ & Wdr.
5,500′ 3/4 No. 2 C & B Pl. R & WO.
160,000′ 4/4 S.W. R & WO.
300,000′ 4/4 No. 3 Com.
20,000′ 5/4 No. 3 Com.
22,000′ 6/4 No. 3 Com.
12,000′ 8/4 No. 3 Com.
50,000′ 8/4 Bridge Plk. R & W
50,000′ 10/4 " " " fwd.
200,000′ 12/4 " " "

SYCAMORE
130,000′ 4/4 No. 2 C & B Qtd.
1,000′ 5/4 No. 2 C & B Qtd.
400,000′ 4/4 No. 1 C & B

QUARTERED RED GUM
25,000′ 5/4 No. 1 C & Btr.
15,000′ 6/4 No. 1 C & Btr.

PLAIN RED GUM
1,100′ 5/8 FAS
1,800′ 3/4 No. 2 C & Btr.
40,000′ 4/4 No. 2 Com.
3,300′ 8/4 No. 2 C & Btr.

SAP GUM
4,200′ 4/4 Pnl & No. 1 18″ & Up
50,000′ 4/4 Clr strips 3-5 1/2″
20,000′ 4/4 No. 1 C stps 2-5 1/2″
125,000′ 4/4 Box Bds. 9-12″
150,000′ 4/4 Box Bds. 13-17″
6,500′ 5/4 No. 1 Com.
50,000′ 6/4 No. 1 C & Btr.
6,000′ 8/4 No. 1 C & Btr. Qtd.
9,500′ 8/4 No. 1 C & Btr. Qtd. Stps

TUPELO
50,000′ 4/4 FAS 6-12″
5,000′ 4/4 FAS 13-17″
5,000′ 4/4 No. 1 Com. 13-17″
12,500′ 4/4 Box Bds. 9-12″
3,700′ 4/4 Box Bds. 13-17″

COTTONWOOD
100,000′ 4/4 FAS 6-12
30,000′ 4/4 FAS 13-17″
15,000′ 4/4 pnl & No. 1 18″ & Up
40,000′ 4/4 Box Bds. 9-12″
30,000′ 4/4 Box Bds. 13-17″
150,000′ 4/4 No. 1 Com.
100,000′ 4/4 No. 2 Com.

MAPLE
40,000 4/4 No. 1 C & Btr.
50,000′ 5/4 No. 2 C & Btr.
75,000′ 6/4 No. 2 C & Btr.
20,000′ 10/4 No. 2 C & Btr

CYPRESS
20,000′ 4/4 FAS
9,000′ 5/4 FAS
10,700′ 6/4 FAS
20,000′ 8/4 FAS
250,000′ 4/4 No. 1 Shop
15,000′ 8/4 No. 1 Shop
30,000′ 5/4 No. 1 Com.

BY MAKING TEST RUNS OF YOUR LUMBER

You will find that our stock will reduce your costs to a minimum and improve the quality of your product. Indiana hardwoods cost no more than the other kinds—then why not use them ?

We are the largest hardwood producers in Indiana and give below a partial list of stock on hand:

INDIANA QUARTERED WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
1/2″	1 car	1 car	
5/8″	2 "	4 "	
3/4″	1 "	5 "	1 car
4/4″	3 "	4 "	4 "
5/4″	1 "	3 "	1 "
6/4″	1 "	3 "	
8/4″	1 "	2 "	

Also Clear and No. 1 Common Quartered White Oak Strips.

INDIANA QUARTERED RED OAK

	1s & 2s 6″ & up	1s & 2s 9″ & up	No. 1 Com.	No. 2 Com.
1/2″—3500′				
5/8″—1 car			1 car	
4/4″—3 car		1 car	3 "	1 car
5/4″—2 "		1 "	2 "	
6/4″—2 "		2500′	1 "	
7/4″—1 "		4500′		
8/4″—2000′		3000′	1 "	

PLAIN WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	1 car	1 car	
3/4″		4000′	
4/4″	2 "	4 cars	2 cars
5/4″	1 "	3 "	1 "
6/4″	1 "	2 "	
8/4″	3 "	2 "	
2½″	½ "	1 "	

PLAIN RED OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	2 cars	2 cars	
3/4″		5000′	
4/4″	4 "	4 cars	3 cars
5/4″	1 "	3 "	
6/4″	1 "	4 "	
8/4″	2 "	3 "	
2½″	2 "	3 "	

BLACK WALNUT—Steamed Stock

	1s & 2s	No. 1 Com.	No. 2 Com.
4/4″	1 car	3 cars	12000′
5/4″	1 "	1 "	9000′
6/4″	4000′	4000′	
8/4″	1 car	1 car	

1 car 5/8″ Log Run, not steamed.

WE ARE IN POSITION TO KILN DRY THIS LUMBER. ASK FOR OUR RATES.

We also have good stocks of Poplar, Ash, Beech, Hickory, Maple, Gum, Tupelo, etc.—Write us for prices.

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

MILLS AT EVANSVILLE, IND., GRAMMER, IND., and KEIRNS, MISS.

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills : Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

If you are using table slides why not use the best. A trial order will convince you.

Watertown Table-Slide Company

Watertown, Wisconsin U.S.A.

Manufacturers of the famous Roller-Bearing Equalizer Slides.

McDonagh Lumber Co.

203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods
Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

Calhoun Plywood Company

Panels Tops Counter Fronts

OPERA CHAIRS
in the White or finished.

Vegetable or Waterproof Glue.

Sheboygan - Wisconsin

Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

PERCY E. HEENEY

Office: 298 Breithaupt St., KITCHENER, ONT.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

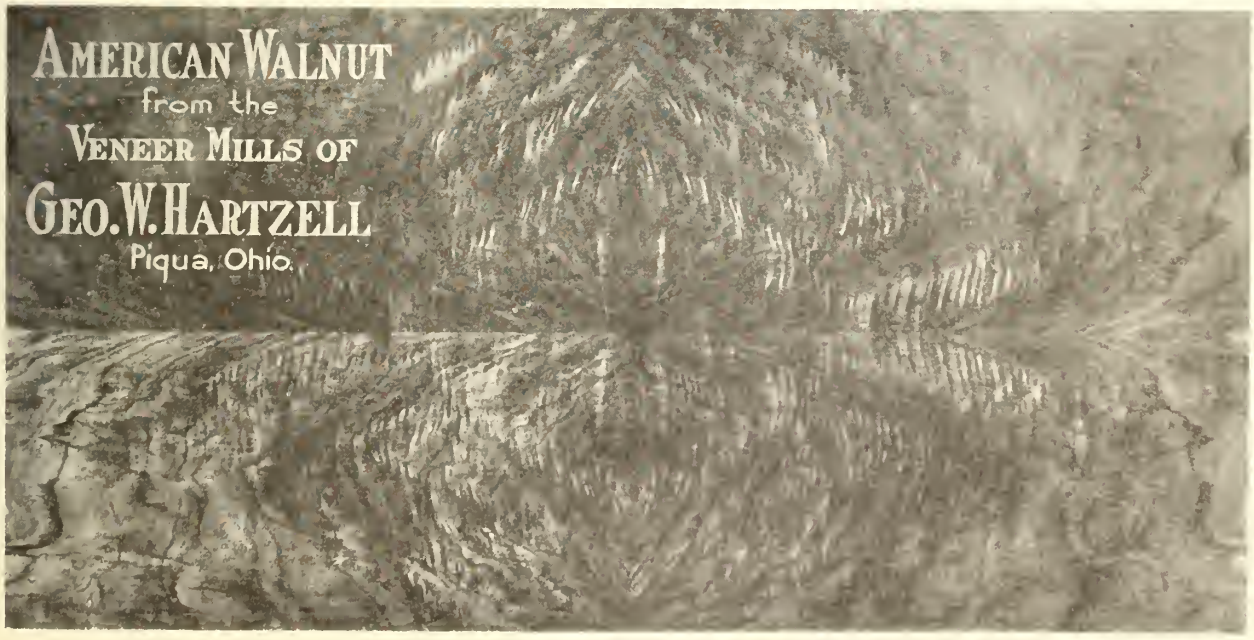
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

Ash Cypress

HAFNER

MANUFACTURING COMPANY

For Immediate Delivery

95000 ft. 1 in. sel. & btr. Cypress
290000 ft. 1 in. No.1 shop Cypress
50000 ft. 1 in. No.1 com Cypress
184000 ft. 1 in. No.2 com. Cypress
20000 ft 2½ in. No. 2 com. White Ash
125000 ft. 1 in. No.1 com.&sel. White Ash
47000 ft. 1¼ No. 1 com. & sel White Ash
60000 ft. 2½ No.1 com. & sel. White Ash

ST. LOUIS, MO., U.S.A.

ESTABLISHED 1871

Oak Red Gum

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

AMERICAN WALNUT

"The Cabinet-wood of the Ages"

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

SALES AMMUNITION:

Our "All-America" campaign for American Walnut *Trade Extension* through advertising is furnishing alert manufacturers and dealers with innumerable selling arguments. The *Walnut facts* alone are what clinch the sales. The best public is "all for American Walnut."

In all of our advertising, including the beautiful series of four-color illustrations in the leading magazines, we are continually driving home the long list of American Walnut's simple and enduring virtues—rich *natural* color, supreme stability and strength, easy working properties, and *unfading* beauty. No stain is needed to produce the royal elegance of warm browns so coveted by the best trade.

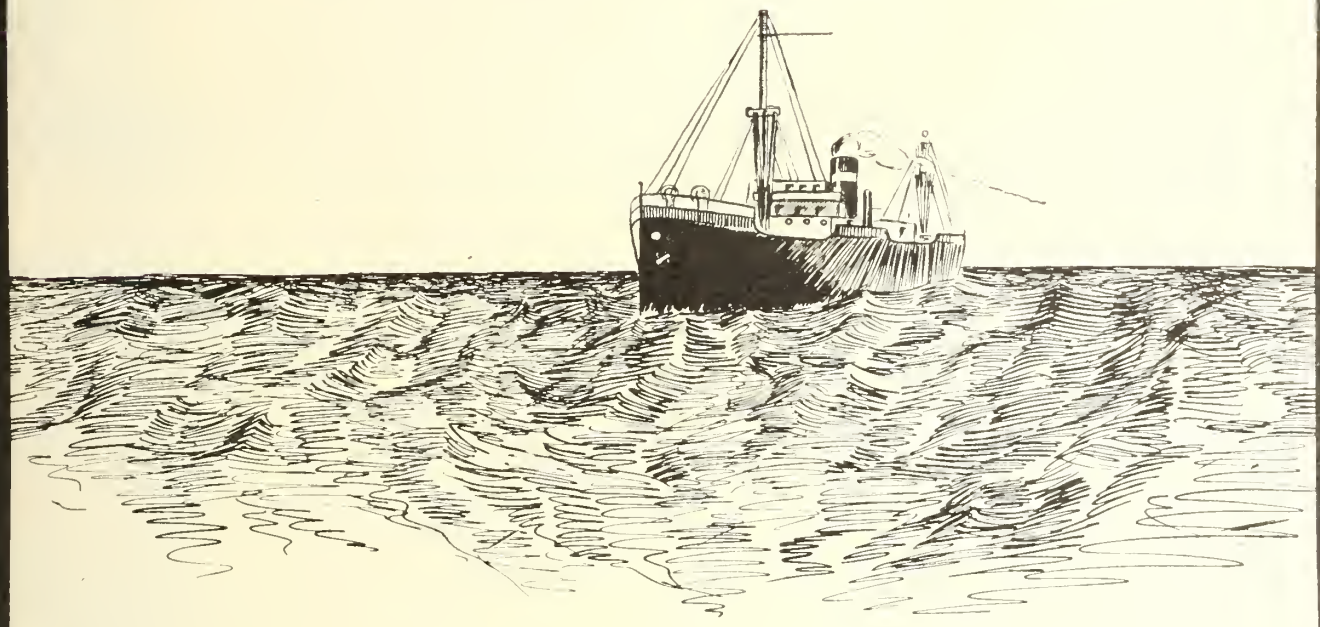
One of the chief causes of the steadily rising demand for American Walnut furniture and interior trim is its faculty for *growing in beauty with the passing of the years.*

"The Cabinet-wood of the Ages" is a true phrase.

Our Walnut Brochure, de luxe, is filled with ideas and suggestions of interest and value to the trade. A request will bring it, with our compliments.

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO, U. S. A.



On October 17, 1906 the S. S. "Corinth" sailed from Axim, Gold Coast, Africa, to Pensacola, Florida, with the first full cargo of mahogany logs ever shipped from the continent of Africa.

Prior to 1860 complete cargos had sailed from Africa, but the holds were laden with human freights from which was manufactured the great American Civil war.

From the valuable cargo aboard the "Corinth" was produced the beautiful and the useful—a contribution to the prosperity and civilization of America.

To the successful venture of this pioneer ship is largely due the position and influence of African Mahogany in the wood artistry of today.

It is immaterial that the Mengel Company were the operators of this ship and the owners of this cargo.

THE MENGEL COMPANY
INCORPORATED
LOUISVILLE, KY.

THE PAST AND PRESENT IN MAHOGANY

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	0/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

On hand for immediate shipment

Furniture Stock:

1	car, 12000 pcs. clear Red gum	2½ x 2½-20"	M
	5000 pcs. clear Red gum	2 x 2 -20	M
1	car, 4000 pcs. clear Sap gum	2 x 2 -30"	D
	9000 pcs. clear Sap gum	2½ x 2½-30	D
1	car, clear Sap gum	2 x 2 -30"	D
1	" clear Sap gum	2½ x 2½-30	D
1	" clear White & Red Oak	2 x 2 -30	D
1	" clear White & Red Oak	2 x 2 -19	D
1	" clear White & Red Oak	1¾ x 1¾-19	D
1	" clear White & Red Oak	1¼ x 2 -40	D
1	" clear White & Red Oak	1 x 1 -48	D
1	" clear White & Red Oak	1 x 2 -16-30	D
	50,000 pcs. Qtd. White Oak	¾ x 3 & Wider 22"	D
	150,000 pcs. Qtd. Red Oak,	¾ x 3 & Wider 22"	D
	40,000 pcs. Qtd. Red Oak,	1 x 2½ & Wider 18"	D
1	car, clear Ash 1¼ x 1¾	2 x 2-38-44-50	
1	" clear Ash 1-⅛ x 1-⅛-7		

MISCELLANEOUS

1	car, clear Oak Auto Bow Strips,—	1-⅛ x 1-⅝-7' & 7' 6"	
		1- x 1-½-7' & 7' 6"	M
1	car, Hickory Pitmans	1-⅝ x 1-⅞-38	D
3	cars Hickory Spoke billetts	1½ x 2 -11	D-M
1	car, clear Ash	2 x 2½-48	D
1	" clear Elm	2 x 2½-48	D
1	" clear Hickory	2 x 2 -38	D

D-Dry; M-Partly dry.

We can furnish your requirements in square or flat dimension. Let us have your specifications.

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office Dimension Mill & Yard
Belt Line at McLean.

MEMPHIS - TENN.

The Following Dry Stock is Ready for Prompt Shipment

HARD MAPLE

300 M Ft. 4/4" No. 3 Com.
600 M Ft. 4/4" No. 2 C&B
75 M Ft. 6/4" No. 2 C&B
300 M Ft. 8/4 No. 1 C&B 10% No 2
15 M Ft. 10/4" No. 1 C&B
80 M Ft. 12/4" No. 1 C&B
30 M Ft. 16/4" No. 1 C&B

SOFT MAPLE

60 M Ft. 4/4" No. 3 Com.
150 M Ft. 4/4" No. 2 C&B
12 M Ft. 6/4" No. 2 C&B
25 M Ft. 8/4" No. 2 C&B
50 M Ft. 12/4" No. 2 C&B
15% No. 2 Com. in the thick stock.

ELM

250 M Ft. 4/4" No. 2 C&B
100 M Ft. 4/4" No. 1 C&B
50 M Ft. 4/4" No. 2 & 3 Com.
40 M Ft. 6/4" No. 1 C&B
25 M Ft. 8/4" No. 1 C&B
15 M Ft. 12/4" No. 1 C&B

BIRCH

14 M Ft. 4/4" No. 3 Com.
25 M Ft. 4/4" No. 2 C&B
36 M Ft. 6/4" No. 1 C&B
60 M Ft. 8/4" No. 1 C&B
15 M Ft. 10/4" No. 1 C&B
14 M Ft. 5/4" No. 1 C&B

BASSWOOD

40 M Ft. 4/4" No. 2 Com.
75 M Ft. 4/4" No. 2 C&B
150 M Ft. 4/4" No. 1 C&B
60 M Ft. 6/4" No. 1 C&B

MISCELLANEOUS

1 Car 4/4" Butternut No. 1 C&B
3 " 6/4" Beech No. 2 C&B
4 " 4/4" Beech No. 2 C&B
1 " 8/4" R. Elm No. 2 C&B 20% No. 2
1 " 4/4" Ash No. 1 C&B
1 " 6/4" Chestnut L.R.
4 " 4/4" Oak L.R.
3 " 4 x 4 Hardwood Hearts
1 " 4 x 6 Hardwood Hearts
3 " 5 x 5 Hardwood Hearts

We have four million feet of new stock under process of manufacture, out of which we could make any special size or grade you may require. Will be pleased to submit prices.

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVE. — TORONTO

SAM D. SMITH

Wholesale Dealer and Manufacturer in

NORTHERN and SOUTHERN HARDWOODS

305 Kent Building, Toronto

Specialty—Sawing Dimenison Stock to Order

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn
Hardwood Lumber

Write or wire for prices on
Gum, Oak, Elm, Etc.

The recent opening of our Concentration and Forwarding Yard, located at Springfield, Ill., has greatly increased our facilities for furnishing prompt service on all orders, ensuring quick shipment of YOUR requirements.

We have now in stock at that point, for immediate loading, an especially desirable supply of the genuine

SOFT TEXTURED WHITE OAK

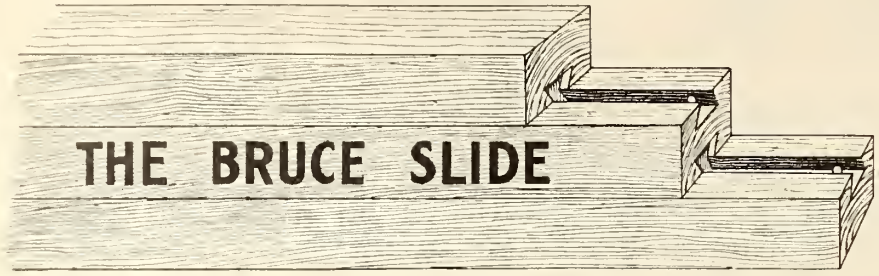
and also complete stocks in Red Oak, Red and Sap Gum, White Ash, Yellow Poplar, Cottonwood, etc., etc.

Write for our latest stock sheet, or we shall be pleased to advise you our lowest delivered prices on your present requirements, upon request.

Wire your enquiries at our expense. Address all correspondence to our Chicago office.

GENERAL HARDWOOD LUMBER COMPANY
118 North La Salle Street - - - - - CHICAGO, ILL.

TABLE SLIDES TABLE RIMS TABLE PINS



Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

MILL PIPING

Shaving and Sawdust Collecting Systems Installed Complete

ALTERATIONS—REPAIRS

Neville-Cooper Co.

130 Ontario St. Toronto

Phone Main 2157

We also manufacture and erect Smoke Stacks, Boiler Breechings, Metal Cornices, Skylights, Eavetrough, etc.

"Casco" for a better product

WATERPROOF GLUE

For Jointing and Veneering

STRONG - UNIFORM
USED COLD - EASILY PREPARED
ECONOMICAL

"CASCO" Uniformity is assured because we manufacture our own Casein. : : :

The Casein Manufacturing Company

Largest and Longest Established Manufacturers of Casein Products in America : : :

15 PARK ROW, - NEW YORK CITY

Write for "CASCO" Red Book—a manual on Veneers, Panel-Making and Glue.

Samples of "CASCO" on request.

Canadian Distributors

HART & LEFEBER, LTD.

38 Grey Nun, Montreal' Que.

FACTORY TRUCKS

Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY

P. E. SHANTZ, PRESTON, ONTARIO.

Factory Truck Style No. 26.

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated

General Office, NEW ORLEANS, U.S.A

Thomas & Proetz Lumber Co.

3406 N. Hall St.

ST. LOUIS, MO.

BELZONI, MISS. — MILLS — CALION, ARK.

Com. & Btr. Quartered White Oak
1″ —925,000 ft.
1¼″—335,000 “
1½″—115,000 “

Com & Btr. Quartered Red Oak
1″ —380,000 ft.
1¼″—150,000 “
1½″—275,000 “

Com. & Btr. Plain Red Oak
1″ —150,000 ft.

Com. & Btr. Plain White Oak
1″ —150,000 ft.
1½″—250,000 “

Com & Btr. Red Gum Plain & Quartered
1¼″—300,000 ft.
2″ —500,000 “
2½″—235,000 “
3″ —180,000 “

Com. & Btr. Sap Gum
1″ —350,000 ft.
1¼″—433,000 “
1½″—750,000 “
2″ —980,000 “
2½″—170,000 “
3″ —350,000 “

Com. & Btr. Quartered Black Gum
1″ —290,000 ft.

Com. & Btr. Tupelo
1″ —235,000 “

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

A few Specials :

130,000 ft. 4-4″ No. 1 and No. 2 Com. Qtrd. White Oak
85,000 ft. 4-4″ No. 1 and No. 2 Com. Qtrd. Red Oak
100,000 ft. 4-4 No. 1 and No. 2 Com. Plain Red Oak

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut
Mahogany, Teak, Oak
Ash, Cypress

ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

The McLennan Lumber Co.
Limited

MONTREAL

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co. Limited
ORILLIA ONTARIO

Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

Oak-Ash-Elm
Maple-Sap Gum
Red Gum-Cypress
Sycamore
Cottonwood

Wire our expense for quotations

Chapman & Dewey Lumber Company

Bank of Commerce and Trust Bldg. Memphis, Tenn.

Branch Office: Rialto Bldg., Kansas City, Missouri

NATIONAL DRY KILNS

"The First Kiln in 6,000 years in which Humidity is Automatically Controlled"

Personal Service

the link
between
the maker
and the operator
of "Nationals"

Mr. C. A. Fields
Our Canadian Representative

Service is the first essential, we believe, in the successful execution of our business. Personal service enables us to keep in close touch with the growing family of National Dry Kiln operators in Canada.

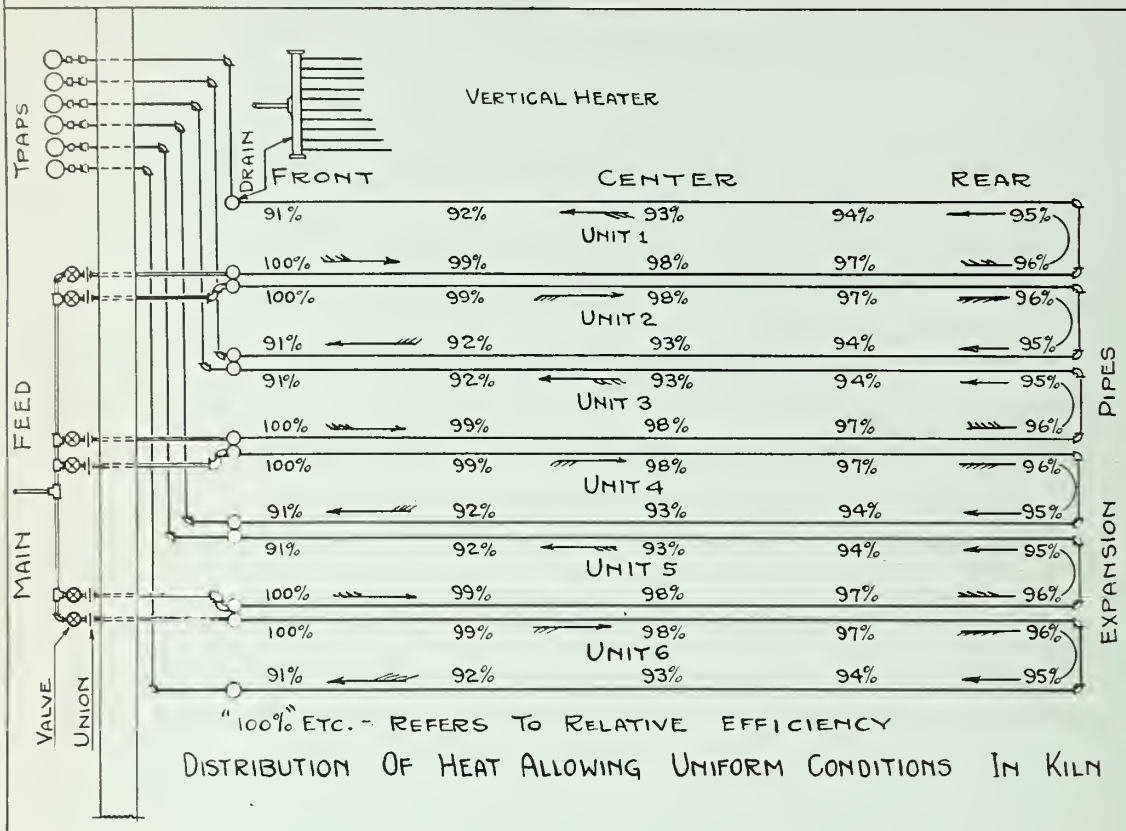
It is our duty and our pleasure to co-operate with you for greater efficiency in Kiln operation whether you now have one of our installations or not. This we are ready to do through the person of our Mr. C. A. Fields.

Mr. Fields will be happy at any time to call upon you and discuss the question of improved kiln drying in your plant.

THE NATIONAL DRY KILN COMPANY
1117 East Maryland Street, Indianapolis, Indiana

C. A. FIELDS, Canadian Representative, P. O. Box 55, Toronto

VERTICAL -VS- HORIZONTAL COILS



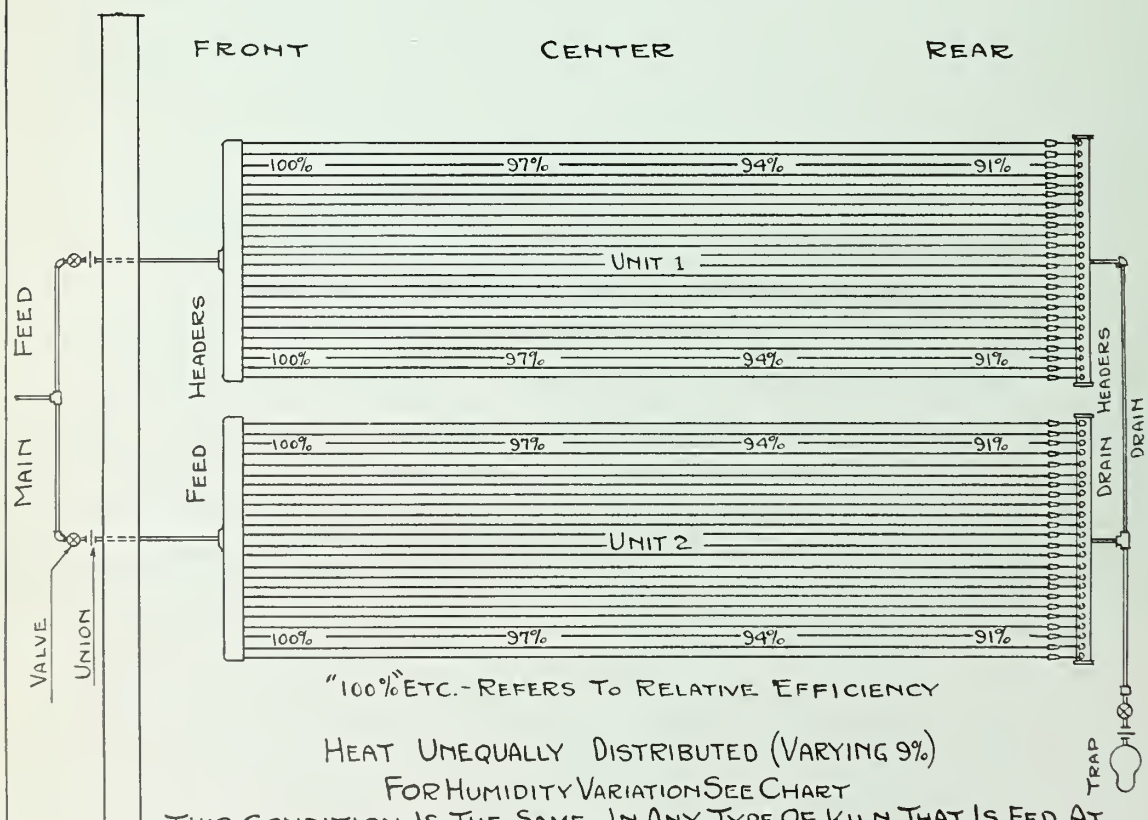
"100%" ETC. - REFERS TO RELATIVE EFFICIENCY

DISTRIBUTION OF HEAT ALLOWING UNIFORM CONDITIONS IN KILN

HUMIDITY UNIFORM
D=DRY BULB READING
W= WET BULB READING
%=PERCENT OF RELATIVE HUMIDITY

STEAMING PERIOD	FRONT	110°-D
	CENTER	110°-W
	REAR	100%
INITIAL PERIOD	FRONT	130°-D
	CENTER	125°-W
	REAR	85%
INTERMEDIATE PERIOD	FRONT	140°-D
	CENTER	126°W
	REAR	65%
FINAL PERIOD	FRONT	160°-D
	CENTER	120°-W
	REAR	30%

HUMIDITY UNIFORM IN ALL PARTS OF KILN



"100%" ETC. - REFERS TO RELATIVE EFFICIENCY

HEAT UNEQUALLY DISTRIBUTED (VARYING 9%)
FOR HUMIDITY VARIATION SEE CHART
THIS CONDITION IS THE SAME IN ANY TYPE OF KILN THAT IS FED AT ONE END AND DRAINED AT OTHER END

HUMIDITY VARIATION
D=DRY BULB READING
W= WET BULB READING
%=PERCENT OF RELATIVE HUMIDITY

	FRONT	CENTER	REAR
STEAMING PERIOD	115°-D 110°-W 85%	110°-D 110°-W 100%	105°-D 110°-W PRECIPITATION
INITIAL PERIOD	136°D 125°-W 73%	130°-D 125°-W 85%	124°-D 125°-W PRECIPITATION
INTERMEDIATE PERIOD	147°-D 126°-W 54%	140°-D 126°-W 65%	134°-D 126°-W 79%
FINAL PERIOD	167°-D 120°-W 24%	160°-D 120°-W 30%	153°-D 120°-W 36%

HUMIDITY VARYING 12 TO 30 PER CENT

"NATIONAL" SUPERIORITY

Uniformity of Temperature and Humidity

YOU probably have in mind something of the detail of some of the ordinary piping systems. We illustrate one of them at the bottom of the opposite page. This is one which we used for some years before we learned better. You will note that steam enters at one end of each coil and drainage is arranged at the other end. The pipes are laid in two horizontal rows and are usually supplied through one or two supply pipes.

Experience and tests in kilns so equipped demonstrate that there is a difference in the average kiln of several degrees between the two ends of the kiln. The exact difference varies considerably, depending upon whether steam is turned "full on" or not. However, even when "full on" a difference of 9% or 10% is usual. In other words, when you have (say) 147° at one end of the kiln, you will have 133° at the other end.

Ordinarily the steam spraying system is such that fairly uniform wet bulb temperature is secured. Assuming this to be (say) 126°, we find that your relative humidity varies from 54% at one end of the kiln to 79% at the other. In other words, the drying power is 1.46 times as great in one end as in the other.

This explains why a kiln equipped in this manner will dry some part of its charge of lumber perfectly, and case-harden, honeycomb and check other parts of it. It explains why, after part of the lumber is dry, you often have to wait days for the balance to get dry.

On the chart shown opposite we have tabulated the variation in temperature and humidity which occurs during the four normal periods of lumber drying. Note that during the primary period, when you desire 100% humidity, with the old type of equipment, it may be raining in one part of the kiln and lumber may be drying in another part, neither of which is correct.

During the initial drying period, in which the lumber generally contains considerable free moisture, it is best practice to use about 85% humidity, yet with poor equipment the operator may still find it raining at one point and too low humidity at another. And so on through the process, the operator constantly finds himself badly handicapped by the exceedingly unequal drying power of the air.

We provide for uniform distribution of heat in our compartment heating system, arranging it in the manner indicated by the diagram at the top of the opposite page. **Distribution is secured by making every run of pipe do the round trip, from one end of the kiln to the other and back again. This makes the average efficiency of the radiation the same in any cross-section.** The hotter part is parallel with the cooler part. This arrangement gives uniform heat throughout the length of the kiln. This is an exclusive feature of NATIONAL kilns.

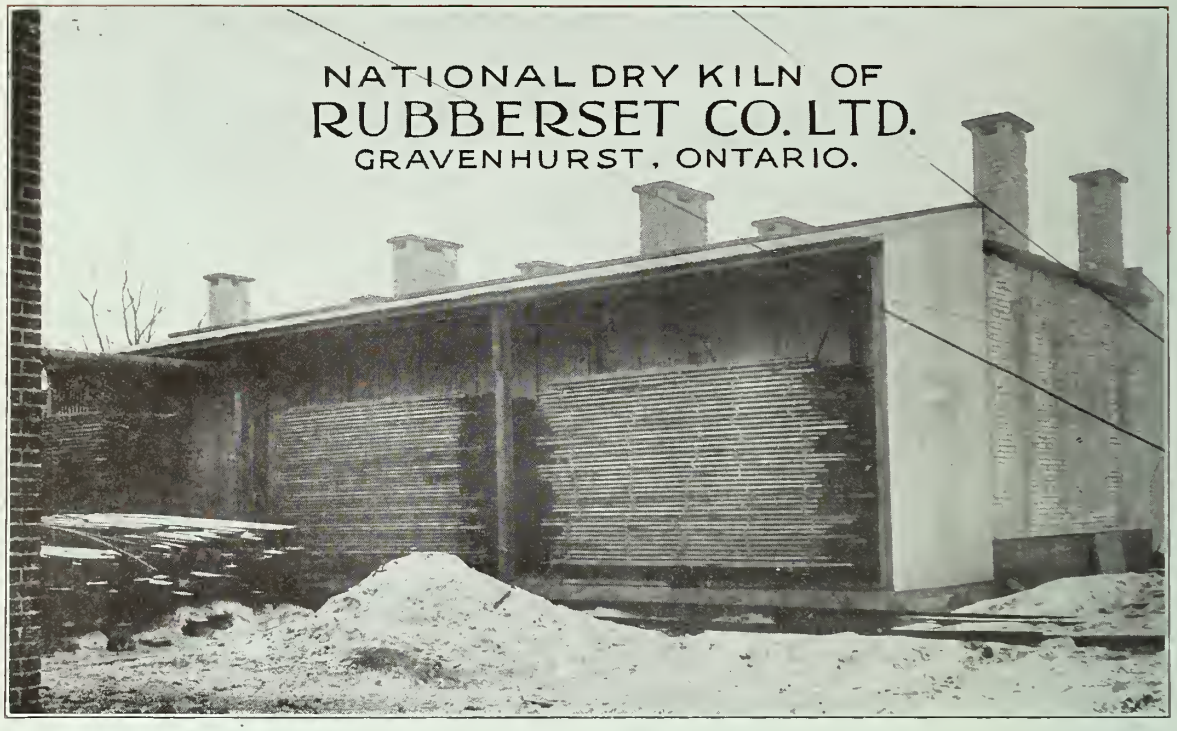
This letter proves the old adage in a very convincing manner. Similar letters from other Canadian firms using our equipment give further proof of the superiority of National Dry Kilns and the advisability of using the correct basic principles in making an installation of this kind.

THE NATIONAL DRY KILN COMPANY

1117 East Maryland Street, Indianapolis, Indiana

C. A. FIELDS, Canadian Representative, P. O. Box 55, Toronto

NATIONAL DRY KILNS



Installed in 1920

"Anything worth doing is worth doing well"

This letter proves the old adage in a very convincing manner. Similar letters from other Canadian firms using our equipment give further proof of the superiority of National Dry Kilns and the advisability of using the correct basic principles in making an installation of this kind.

The National Dry Kiln Co.,
Indianapolis, Indiana.

Gentlemen:

It gives me great pleasure to inform you that our National Kilns are working perfectly in every particular.

As you know, our kilns are equipped with all your automatic control devices, such as the automatic water supply tanks, dry bulb thermostat, wet bulb thermostat, scalo meters, recording thermometers, door carriers etc.

I thought, when installing the kiln, that some of the above were superfluous, but I can assure you that I would not think of doing without any one of them now. We have been operating our kilns for about two months, and find them to work better every day.

With the full information you give, along with the blue prints for installing, anyone who can read should have no trouble putting in the equipment.

We have just had all the pipes leading to the kiln covered with Johns-Manville insulating preparation, which we find is a great saving in heat.

I shall be pleased at any time to give you any information you may desire about our kilns.

Very truly yours,

Rubberset Company, Ltd.,
Gravenhurst, Ontario,
Per J. J. McIntosh,
Superintendent.

THE NATIONAL DRY KILN COMPANY

1117 East Maryland Street, Indianapolis, Indiana

C. A. FIELDS, Canadian Representative, P. O. Box 55, TORONTO, Ont.

OAK

Plain and Quartered

Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manu facture.

Oak Timbers and Planking

The Mowbray & Robinson Co.
(INCORPORATED)

Manufacturers

Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative :
A. K. Johnson, Traders Bank Building, Toronto, Ont

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

ELM MAPLE

FOR SALE RUSH LUMBER COMPANY FOR SALE

GUM OAK

ASH POPLAR

QTD. WHITE OAK			
4-4	F. A. S.	2,000′	
4-4	F. A. S. 10″ & up	1,000′	
4-4	No. 1 Com.	15,000′	
4-4	No. 2 Com.	15,000′	
5-4	F. A. S.	14,000′	
5-4	No. 1 Com.	8,000′	
5-4	No. 2 Com.	4,000′	
6-4	No. 1 Com.	30,000′	
6-4	No. 2 Com.	20,000′	
8-4	F. A. S.	5,000′	
8-4	No. 1 Com.	3,000′	
PLAIN WHITE OAK			
4-4	No. 1 Com.	5,000′	
4-4	No. 2 Com	8,000′	

4-4	Sound Wormy .	25,000′	
4-4	No. 3 Com.	70,000′	
5-4	F. A. S.	2,000′	
5-4	No. 2 Com.	13,000′	
6-4	No. 1 Com.	2,000′	
PLAIN RED OAK			
3-4	No. 1 & 2 Com.	70,000′	
4-4	F. A. S.	2,000′	
4-4	No. 1 Com.	10,000′	
4-4	No. 2 Com.	20,000′	
5-4	F. A. S.	7,000′	
5-4	No. 1 Com.	15,000′	
5-4	No. 2 Com.	3,000′	
QTD. RED GUM			
4-4	F. A. S.	7,000′	

4-4	No. 1 Com.	13,000′	
5-4	F. A. S.	2,000′	
6-4	F. A. S.	3,000′	
6-4	No. 1 Com.	14,000′	
RED GUM S. N. D.			
8-4	No. 1 C&B. ...	70,000′	
10-4	No. 1 C&B. ...	40,000′	
SAP GUM			
5-8	No. 2 Com.	7,000′	
5-4	F. A. S.	1,000′	
5-4	F.A.S. 13″ & Up	4,000′	
5-4	No. 1 Com.	9,000′	
6-4	F. A. S.	11,000′	
6-4	No. 1 Com.	6,000′	
6-4	No. 2 Com.	4,000′	

POPLAR			
4-4	No. 2 A Com. ..	25,000′	
4-4	No. 2 B Com. ..	35,000′	
5-4	Sel. & Bet.	9,000′	
5-4	Saps	3,000′	
5-4	No. 1 Com.	12,000′	
5-4	No. 2 A Com. ..	8,000′	
6-4	Sel. & Bet.	7,000′	
6-4	No. 2 Com.	12,000′	
8-4	Sel.	3,500′	
8-4	Sap	8,000′	
8-4	No. 1 Com.	3,000′	
MISCELLANEOUS			
4-4	L. R. Qtd. B. Gum	25,000′	
4-4	L. R. Pln. B. Gum	25,000′	

MEMPHIS, TENN.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. Submit your enquiries to our Sales office, Cincinnati, Ohio.

The Talge Mahogany Co.

INDIANAPOLIS

Offers you the most exclusive line of **Foreign and Domestic Veeners and Lumber**

We specialize in

Mahogany, Walnut and Oak

No Order too Small — No Order too Large

HERMAN **BEHR** & CO. INC.

BOSTON—BROOKLYN—NEW YORK—CHICAGO
SAN FRANCISCO—ST. LOUIS—GRAND RAPIDS

SANDPAPERS

FIFTIETH YEAR

Only the best Garnet paper is good enough for your drum sander —therefore why not get Behr's brands now

?

EVERY KERNEL IS AN IMP OF EFFICIENCY WORKING FOR YOU

Do Not Gamble on Your Veneer Tapes

BUY THE BEST.

Ideal Veneer Tapes

The material with the guarantee behind it

Profit by our many years' careful application to the subject of Veneer Tapes.

We have several qualities, cloth and paper, plain and perforated, which will cover all of your requirements.

Write for booklet.

IDEAL COATED PAPER CO.

Veneer Tape Specialists

Main Offices and Mills, BROOKFIELD, Mass.

Beech
Birch
Basswood
Maple
Gum
Mahogany

REGISTERED H.B. P.K. TRADE MARK

HALL BROS. LIMITED

LUMBER & TIMBER
TORONTO CANADA

Rock Elm
Ash
Soft Elm
Oak Plain & Qtd.
Chestnut
Walnut

Manufacturers and Wholesalers

HARDWOOD & SOFTWOOD LUMBER

Specializing for Furniture & Woodworking trades all grades and all thicknesses.

300 Crown Office Building, Toronto, Ontario — Mills at Marlbank, Ontario

WAYNE LUMBER CO.

Manufacturers and Wholesalers

American and Canadian
Hardwoods

Birch and Maple—Our Specialty

Elm, Ash, Basswood, Beech, Chestnut, Oak, and Poplar

110 West 40th St. New York

Canadian Representative,
D. Cote, 730A Champagneur, Outremont, Montreal

BEDNA YOUNG Lumber Company

Jackson - Tennessee

Manufacturer of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for

High Grade Lumber

please let us have your enquiries.

HARDWOOD LUMBER

"A Quality you will admire"

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Kiln Dried Products

Our kiln at Owensboro is a thoroughly modern equipment for handling green or dry lumber with efficiency and entire satisfaction.

Our facilities enable us to give real service—straight or mixed carloads.

Try our soft textured and finely figured quartered-sawn red and white oak. It will please you.

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills Owensboro; Campbellsville, Kentucky

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Reputation - Making Lumber

The person buying a piece of furniture is often attracted by the beauty of the wood even before looking for signs of good workmanship and other essentials.

That is the kind of lumber you want.

And we do not hesitate in saying we can supply you with it.

Just let us have a trial order.

Memphis Band Mill Company

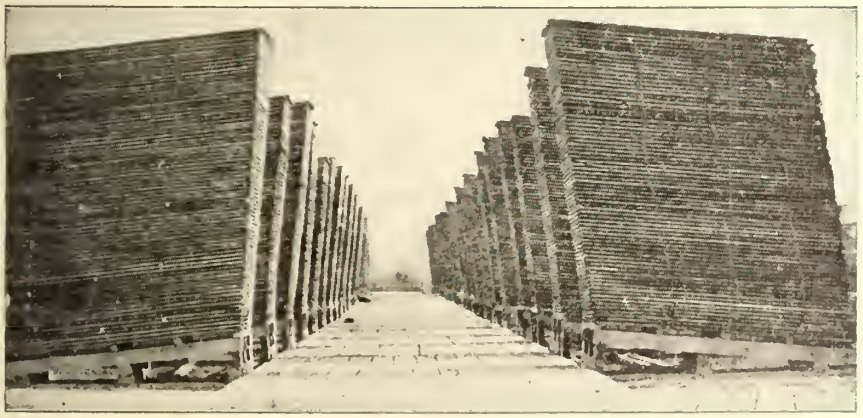
"Makers of high grade lumber"

QUALITY

Memphis - Tennessee

SERVICE

Efficiency Marks Every Step of Our Service to You



Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

Try a Carload-straight or mixed

Soft Oak, plain and quartered
Poplar, Walnut, Chestnut,
Ash and other Hardwoods

LELAND G. BANNING

Cincinnati, Ohio, Bandmill at Frankfort K Y.

Get in touch with our representative

Canadian Representative: A. E. Klippert, 11 Laxton Avenue, Toronto, Ontario

FIBRO-CANE PATENTED OPEN WEBBING

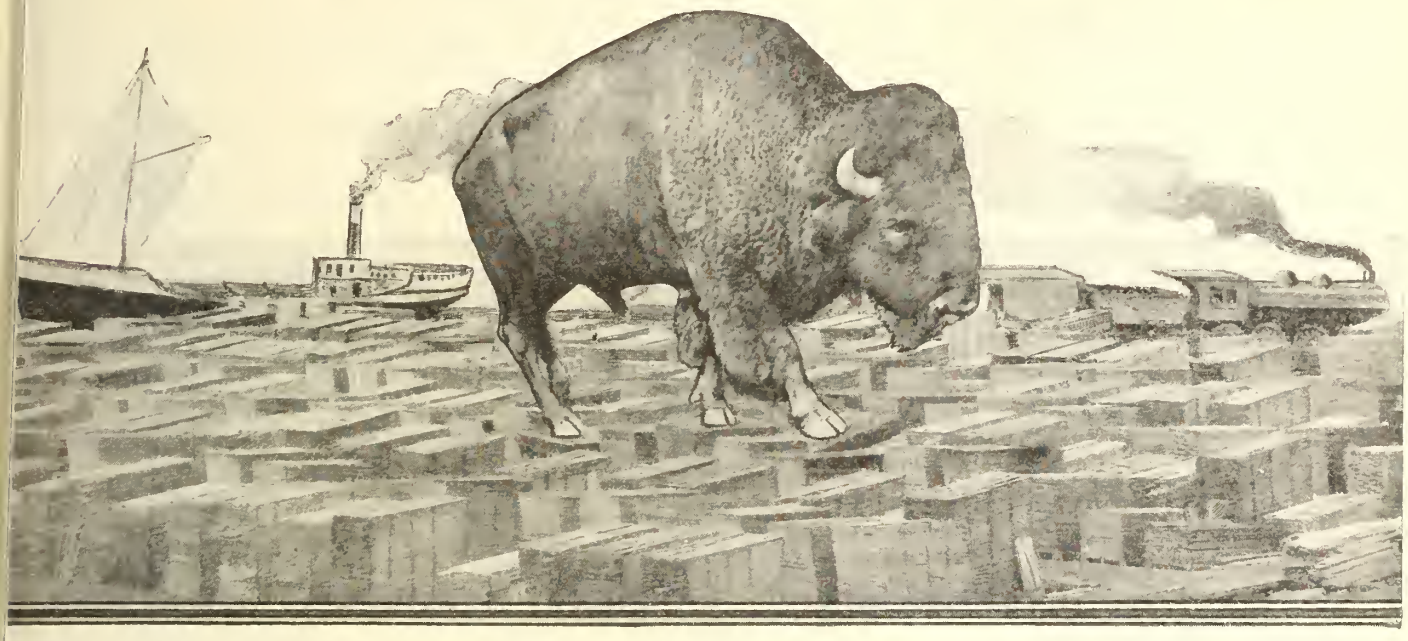
If you use open cane you can use
FIBRO - KANE

"Our best customers are our oldest customers"

FIBRO MANUFACTURING CO.

Drexel Building, Philadelphia

Buffalo for Hardwoods



"LET BUFFALO DO IT"

Buy and Sell Your Hardwoods in Buffalo

Do you want prompt shipment? We can give you service. Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.

Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

Frank T. Sullivan
Specialities:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
Northern Grey Elm
and
Brown Ash
Niagara Street Cornor Arthur

ATLANTIC LUMBER COMPANY
HARDWOODS
West Virginia Soft Red and White Oak
Our Speciality: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller, Sturm & Miller
1142 Seneca Street
Hardwoods of All Kinds

YEAGER LUMBER CO., Inc.
SPECIALITIES
Oak, Poplar, Ash, Maple
932 Elk Street.

STANDARD HARDWOOD LUMBER COMPANY
HARDWOODS
Prompt Shipment } From Buffalo Yards or from mill direct to you
8 Million Feet Dry Stock on hand
1333 Clinton St.

G. Elias & BRO., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and fir timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B WALL Pres. T. H. WALL Vice-Pr.
M. M. WALL, Treasurer
940 SENECA ST.
We Specialize in White Ash, Oak, Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

HUGH McLEAN LUMBER CO.
Hardwoods of all Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

TAYLOR & CRATE
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White OakVeneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

Sawed Veneer

Quartered White Oak

For Furniture and Panels

Plain Red Oak

For Interior Trim and Doors

Cypress

For Battery Separators

Manufacturing Uniformly Good. Quality Unsurpassed

James E. Stark & Co., Inc.

MEMPHIS, TENN.

Highest Quality
St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

ASH
OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.
General Office - FORT WAYNE, Ind.

OUR EXPORT BRAND

Service **LHC** *Quality*

Prompt *Shipment*

SPECIAL
Plain White Oak
50 M' 1" FAS
30 M' 1¼" FAS
12 M' 1½" FAS
15 M' 2" FAS

SPECIAL
Plain White Oak
70 M' 1" No.1 C&S
20 M' 1¼" No.1 C&S
20 M' 1½" No.1 C&S
15 M' 2" No 1 C&S

GUM
ASH
OAK
POPLAR
CHESTNUT

LIVERPOOL HARDWOOD COMPANY Inc.
50 Church St. NEW YORK CITY
Bank of Commerce Bldg. MEMPHIS, TENN.

Sell West

Canada's great Inland Empire extending from the Great Lakes to the Pacific is an expansive market for Furniture

The "Commercial and Retail Merchants' Review" offers advertising space that reaches 75 per cent. of the buying power of the four Western Provinces. We will gladly furnish sample copies on request.

The great distances between buyers make trade papers the most profitable sales force

Commercial
and Retail Merchants' Review

212 Winch Building
VANCOUVER

302 Travellers Building
WINNIPEG

Branches in Montreal, Toronto, Chicago and New York

Why Bruce Hardwoods Excel

For many years before we became hardwood lumber manufacturers, we were makers of fine Oak Flooring and are to-day the largest individual producers of that material.

The producing of good Oak Flooring is an exacting science—where perfection is attained—and teaches the value of both skilful grading of raw material and accuracy in milling.

With a full appreciation of the value of these factors, we entered also upon the manufacture of southern hardwoods and in the operation of this department, have applied them in the production of all items in white and red oak, gum, ash and other species.

With our joint facilities, we are equipped to ship square edge parquetry strips, oak trim and mouldings, as well as Oak Flooring in the same car with hardwood lumber.

Inquiry and correspondence invited.

E. L. BRUCE COMPANY

MANUFACTURERS

MEMPHIS, TENN.

Band Mill: Little Rock

Oak Flooring Plants: Memphis; Little Rock

CANADIAN · NASHUA · PAPER · CO · LTD
QUALITY
TRADE MARK
PETERBOROUGH ONT.

Proud of our Country and Proud of our Country's Products

This is the keynote of Canadian Business to-day, and reflects truly the spirit pervading our industries.

Nashua Veneer Tapes are used generously by the Woodworking Trade and are giving perfect satisfaction. They are "our" Tapes, and as such, we invite constructive criticism from all.

THE CANADIAN NASHUA PAPER CO., Ltd.

Peterborough, Ont.

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

MANUFACTURERS EXPORTERS

SOUTHERN HARDWOODS

Panola Lumber & Manufacturing Co.
Pritchard-Wheeler Lbr. Co.
Kellogg Lumber Co.

GENERAL OFFICES
BANK OF COMMERCE & TRUST CO. BLDG.
MEMPHIS - TENNESSEE

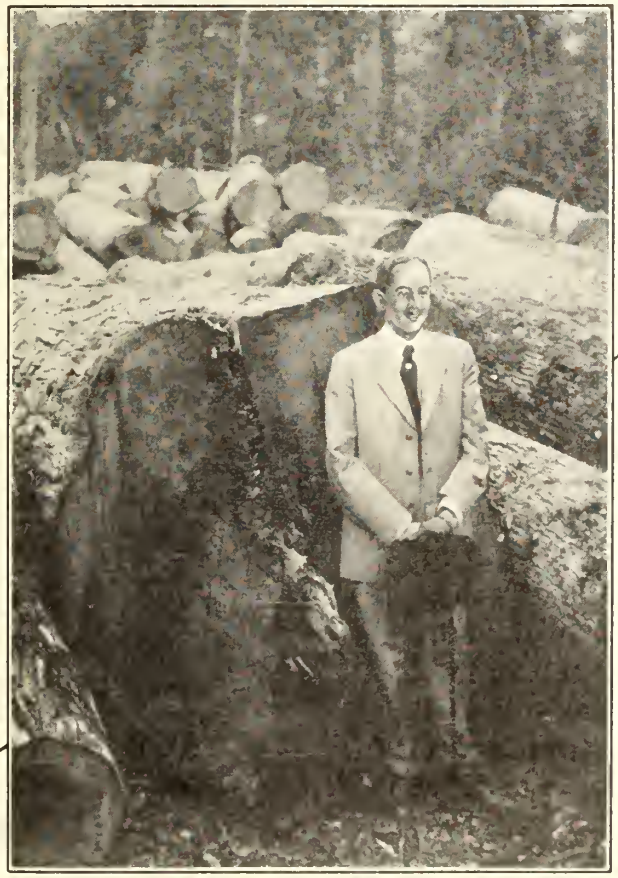
MILLS.
Batesville, Mississippi
Wisner, Louisiana
Madison, Arkansas
Fondale, Louisiana

We Manufacture and Market Annually from our own mills
OVER SIXTY MILLION FEET

Long-Bell

Southern Hardwoods

Distinctive In
MANUFACTURE
TEXTURE
GRADE
QUALITY



Red Gum
Sap Gum
Black Gum
Tupelo
White Oak
Red Oak
Yellow Poplar
Ash
Elm
Hickory
Cypress
Magnolia
Maple
Beech
Holly
Basswood

Hardwoods from the Saline River bottom of Arkansas and the Bucatanna basin region of Mississippi are produced in quantity and in all commercial sizes by the Long-Bell Lumber Company.

Because of the unusual quality of hardwoods cut on our timber holdings and the exceptional service we are able to render in regard to delivery of items and grades specified, we distinguish our hardwoods with the nationally known Long-Bell brand.

We will send free to Purchasing Agents and Executives a copy of our book "From Tree to Trade," the story of lumber from the woods to the finished product. Please mention this publication.

The Long-Bell Lumber Company

R. A. LONG BUILDING Lumberman since 1875 KANSAS CITY, MO.

WIS

SOFT TEXTURED

MISSOURI YELLOW CYPRESS

Anyone acquainted with Cypress knows that it is one of the most durable of woods and in the Missouri Yellow variety it works easily and has an attractive grain. In the lower grades our lumber is remarkably free of peck and shake, reducing waste to a minimum, and taking into consideration the fact that our grades are Supreme, the few Specials we list herewith should appeal to Industrials and the Retail Yard trade.

SPECIALS FOR IMMEDIATE SHIPMENT

	Months Dry	Average Width	14′ & 16′ Lengths
20,000′ 4/4 1s & 2s	10	12″	80%
18,000′ 5/4 1s & 2s	10	12″	80%
7,000′ 8/4 1s & 2s	10	12″	90%
50,000′ 6/4 Selects	10	8″	75%
100,000′ 4/4 No. 1 Shop	10	8″	80%
200,000′ 4/4 No. 1 C	8	7½″	85%
200,000′ 4/4 No. 2 C	8	7″	80%
100,000′ 4/4 x 9″ No. 1 C	8		90%
100,000′ 4/4 x 10″ No. 1 C	8		90%
100,000′ 4/4 x 8″ No. 2 C	8		90%
100,000′ 5/4 No. 1 C	8	7½″	90%
100,000′ 6/4 No. 1 C	8	7½″	90%

Note that each item shows number of months on sticks, approximate average widths and percentage, 14′ and 16′ lengths.

WRITE FOR VERY ATTRACTIVE PRICES

WISCONSIN LUMBER COMPANY

MANUFACTURERS SOUTHERN HARDWOODS

BAND MILLS
DEERING, MISSOURI

SALES OFFICE
CHICAGO, ILLINOIS

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES - that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

Lumber

Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers

Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

Everything in Hardwood

Thoroughly Air Dried

Plain Red and White Oak		Quarter-cut Red and White Oak
Birch	Soft Elm	Chestnut
Maple	White Ash	Basswood
Beech	Black Ash	Cypress
Rock Elm	Whitewood	Red Gum
		Yellow Pine

All the above kinds of wood in different thicknesses.

Can make prompt shipment from our yard in Toronto as we carry a large stock on hand at all times.

The Johnston Lumber Co.

Foot of Spadina Ave., Toronto

Phone Adelaide 1249

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars.

All Canadian and American Hardwoods
Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

EASTERN BRANCH—38 GREY NUN STREET, MONTREAL

CANADIAN
WOODWORKER
and
Furniture Manufacturer

Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
35 Adelaide Street West - - - - - - TORONTO
Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.
Subscription, $2.00 a year; foreign, $2.50.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 Toronto, February, 1922 No. 2

What is the Basis for Lower Prices for 1922?

In making the February issue of the "Canadian Woodworker and Furniture Manufacturer" a special "Modern Methods Furniture Number," we believe we are suggesting the foundation for lower manufacturing costs in furniture factories and in woodworking plants. During the last decade woodworking methods and equipment have undergone vast, even startling changes; system has been applied to manufacturing operations, factory organization has been introduced and new types and designs of equipment evolved, with the result that to-day it is possible with modern methods to increase output, reduce costs and, at the same time, improve the quality and finish of the product.

It has been said, and truthfully, that woodworkers as a class are conservative, too conservative for their own best interests. They are too prone to cling to old theories, old methods and old equipment and as a result have failed to keep pace with the progress and development in their own field. This may have been alright in the past but it will not do for the present. To-day we are faced with a new set of conditions and whether we desire it or not, increased efficiency is becoming absolutely necessary, is, in fact, being forced upon us.

A struggle for business supremacy will, it is predicted, be witnessed during the year on which we have just entered. Throughout the coming months, all business offering will be more strenuously contested for than during 1921 and preceding years. In this contest honors and profits will go to those manufacturers who, for the least money, have the most to offer in the way of goods, services and deliveries; in other words, the successful ones will be those who can sell the cheapest at a profit.

The last phrase "at a profit," is not without its significance. In the furniture and woodworking industry there is a marked tendency to forget profits and cut, cut, cut, in an effort to overcome competition and secure sufficient business to keep plants operating on something approaching a normal basis. This is due partly to a lack of cost knowledge and partly to the fact that, in this important industry, salesmanship has degenerated to competition in price-cutting. This is to be deplored. It is a basic economic principle that all business should show a profit.

Present values in the furniture and wood fabricating industries are sound inasmuch as they are based on present-day costs figured on replacement values and with profits reduced to a narrow margin. This does not leave much room for price manipulations and reductions. If lower prices are necessary to maintain prestige, overcome competition or secure business, there is only one justification for bringing down values—decreased manufacturing costs. The basis for lower prices for 1922 must be increased efficiency.

Reference has been made in one of the preceding paragraphs to new and improved equipment. Some of these developments are touched on in articles appearing elsewhere in this issue. Descriptions will be found of saws which do the work of many old-time machines, double-end tenoners which end-tenon and dimension at fast rates, high speed shapers with greatly increased output, clamp carriers, double mitre saws, shaping lathes, sanders and finishing and veneer room equipment. The purchase of modern equipment of these types can hardly be classed as an expense. Many of these machines will, if given half a chance, pay for themselves in a very short period. All will tend to lower manufacturing costs.

It is hardly to be expected that any manufacturer will scrap all his present plant and replace it with modern machinery, though such a move would prove a revelation to many woodworkers. There are, however, weak spots in every factory which should be sought out and strengthened. A new machine here, a slight change there, often works a startling change, resulting in higher production and lower costs. Was it not Andrew Carnegie who said that a manufacturer should re-invest his profits in his own business rather than in a field with which he is not so familiar? Money placed in new equipment will pay handsome dividends and lead to still further expansion and growth. It is best to make a thorough study of all operations and every detail of the manufacturing process, outline a programme of improvement and development and then follow it persistently and consistently.

In striving for greater efficiency other phases of activity such as management, merchandising, factory organization, labor problems and purchasing should each receive attention. In connection with the buying of raw materials, supplies and equipment, the advertising pages of this and every other issue of the "Canadian Woodworker and Furniture Manufacturer" afford an interesting study. One Ontario manufacturer recently stated that making a practice of reading trade journal advertising has given him many new ideas and has been the means of saving him thousands of dollars. The educational side of advertising is often overlooked, yet many good practical ideas are to be found in other than the strictly reading pages. Would it not be well to scrutinize every page before you permit this number to leave your hands?

One good habit is better than a dozen rules. The safety habit is a good one.

Straight line handling: Railroad, then yard storage tracks, then kilns, then plant.

How to Save $3.00 per M. on Lumber Costs

Excessive Handling Adds to Cost of Lumber at Factory Door—Capacity of Kilns Automatically Increased—Overhead and Carrying Charges Drop—Lumber Lift Aids Production in Breaking-out Department

By VICTOR J. JOSE, Jr., Indianapolis.

Only two handlings "from car to saw" of the individual board, is the modern plan in lumber handling. And this is not merely theory, but actual practice now in many plants, for example, the Marmon Automobile plant as shown above.

Of course, the conditions to be found in every plant present definite engineering problems. No lay-out can be prescribed as good for every plant. The location of the switch, from which the inbound lumber is handled, the amount of space available for storage tracks of the green lumber, and for storage tracks of the dry lumber after it comes from the kiln as well as the relative location of these spaces, determine the general plans of each particular layout. The right kind of a layout not only saves cost of handling, but is valuable in producing savings in the quality of the lumber and thus indirectly in the results in other steps of production. The wrong kind of a layout means non-essential labor, employment of unnecessary men and actual waste in degrade material.

In the Marmon plant the straight line idea is worked out and adopted in addition to the modern plan of piling the lumber directly on the kiln cars as it comes off of the railroad cars. The railroad switch is run across the end of a series of loading tracks. From the railroad car door they have three portable roller conveyors. As the man in the car picks up a board, he puts it on to one of the three, according to its length. At the door is the lumber grader who scales it and grades it, making his record as the board goes past. It travels down the conveyor to kiln trucks on one side of three loading tracks. In this way they load separate lengths on each truck, which has a decided value in producing less warping and better dried lumber. It also facilitates the handling in their cutting room. The method of grading saves them the salary of one grader and sometimes two.

All the lumber is loaded on to kiln trucks in this manner. After loading the truck, it is pushed on to a designated storage track between the railroad and the kiln. These tracks are known as "green storage" tracks, and each track is used for a certain kind and certain length of lumber. As a result, they have a veritable "yard on wheels," with everything separated so as to facilitate speedy and definite handling when they are ready to load a kiln.

One of the big advantages of this storage system is that it actually increases the capacity of the present kilns. It does this in the obvious way of permitting the lumber to dry while standing out on the track waiting, because it is all stuck with plenty of air spaces, just as it is to go into the kiln.

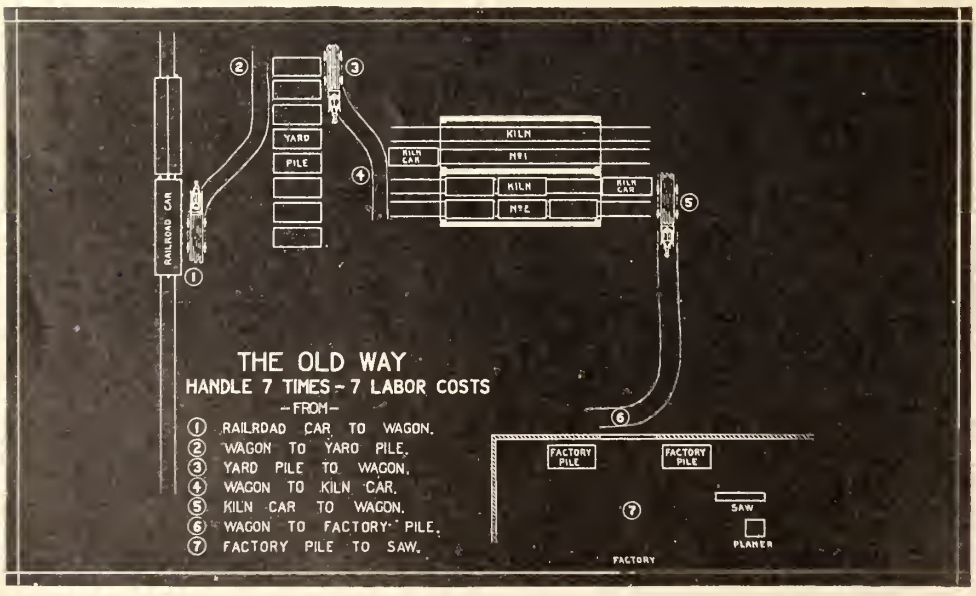


Fig. 1—Stock sometimes handled seven times before it reaches factory.

The more it dries there, the less moisture to be taken out in the kiln, and therefore, the sooner a charge goes through, leaving the kiln ready for the next charge. And, of course, it does lose more moisture, piled this way, than with the old methods.

But the big advantage is in providing a complete charge of lumber at all times whenever a kiln is emptied, without the usual wait for loading the required number of new cars. Few firms realize what a big portion of the time their kilns lie idle, due to this. When one charge is taken out, at many plants, the loads for the next one are being loaded and pushed in one at a time. This may take a day or may take three days, depending upon the weather, the size of the kiln, etc. But is should not take over 30 to 60 minutes. The cars should have been loaded either as in the above case, when the railroad car was unloaded, or, while the last charge in the kiln was drying; and should be standing on the green storage tracks ready. Pushing them onto a transfer car and into the kiln is a matter of minutes. The kiln then goes right ahead on the next charge.

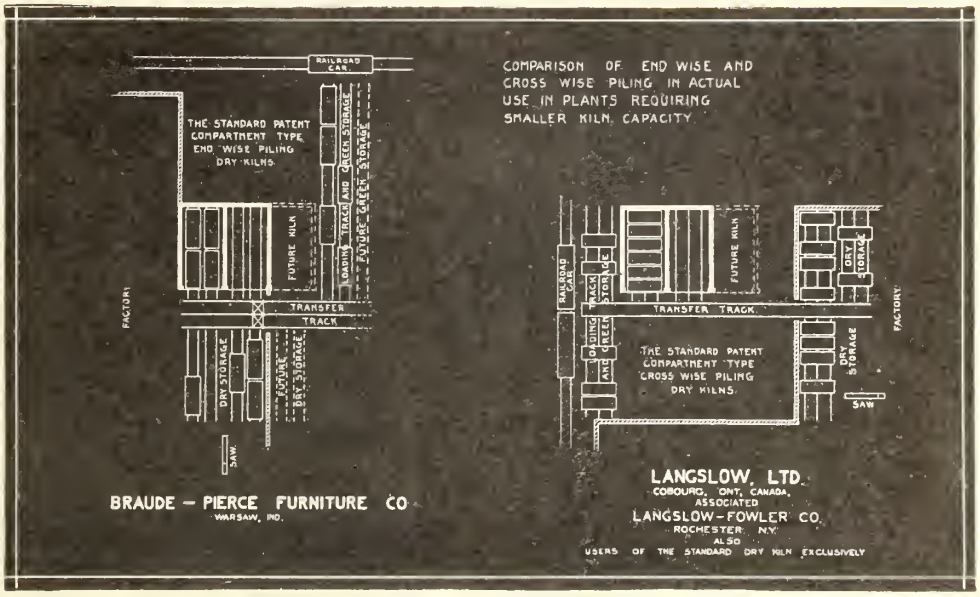

COMPARISON OF END WISE AND CROSS WISE PILING IN ACTUAL USE IN PLANTS REQUIRING SMALLER KILN CAPACITY
RAILROAD CAR
THE STANDARD PATENT COMPARTMENT TYPE END WISE PILING DRY KILNS
FUTURE KILN
LOADING TRACK AND GREEN STORAGE
FUTURE GREEN STORAGE
TRANSFER TRACK
FACTORY
DRY STORAGE
FUTURE DRY STORAGE
SAW
BRAUDE – PIERCE FURNITURE CO
WARSAW, IND.
THE STANDARD PATENT COMPARTMENT TYPE CROSS WISE PILING DRY KILNS
LANGSLOW, LTD.
COBOURG, ONT, CANADA,
ASSOCIATED
LANGSLOW-FOWLER CO.
ROCHESTER, N.Y.
ALSO
USERS OF THE STANDARD DRY KILN EXCLUSIVELY

Fig. 3—How two furniture manufacturers have applied this idea.

If the average time of drying a charge is ten days and three days are lost in loading and unloading, then in one month, at least six days have been lost on the two charges. Six days is one-fifth of the month; that is a loss of 20% and this is conservatively figured. The expensive building and all of its equipment on which are being charged overhead and other costs, is taking a vacation 20% of the time. Just take 20% of the fixed charges that are placed against the kiln equipment and see how many dollars are being wasted.

Then figure the amount that is paid for each handling of the lumber in labor costs, to say nothing of the costs due to breakage, improper piling in the yard, teams, hauling, extra men, etc. At least three of the handlings in Fig. 1 occur at the usual plant. The chances are that all seven occur in the average plant. In large plants, using efficient methods, the cost of bare handling is practically never below 50 cents a thousand when such items as overhead, superintending, etc., are taken into account. From that, the figure runs up to four or five dollars. At only $1.00 a thousand, if there are three excess handlings, it means that the product is being made out of material that is costing $3.00 a thousand too much. And if it costs more per thousand, the burden which the product is carrying is even more staggering. That burden follows it right on through to the point where it meets, in competition, the products of other manufacturers who have eliminated the unnecessary handlings—and of course gives them the advantage. The closer one can come to Fig. 2, the less the lumber will have cost when the saw cuts into it in the plant.

The lumber should come to the saw from the "dry storage" tracks, as shown in Figs. 2 and 3. The advantage of dry storage is two-fold: It increases the kiln's drying capacity by providing a space onto which all of the trucks out of a kiln can be moved at once upon completing the drying without waiting to unload any single truck. The kiln is not held up during long unloading periods. Another advantage is that a dry storage space enables one to always have dried lumber ahead of the daily production needs.

This last item is beneficial in many ways. It prevents delays, waiting for dried lumber in case of miscalculation, or of sudden increase in production. Most important and a feature which is assuming greater importance every day in progressive plants, the lumber is allowed to stand when it comes from the kiln. It is still separated by stickers and cools in a natural, normal way inside the plant under temperature and humidity conditions which are the same as those in other parts of the plant.

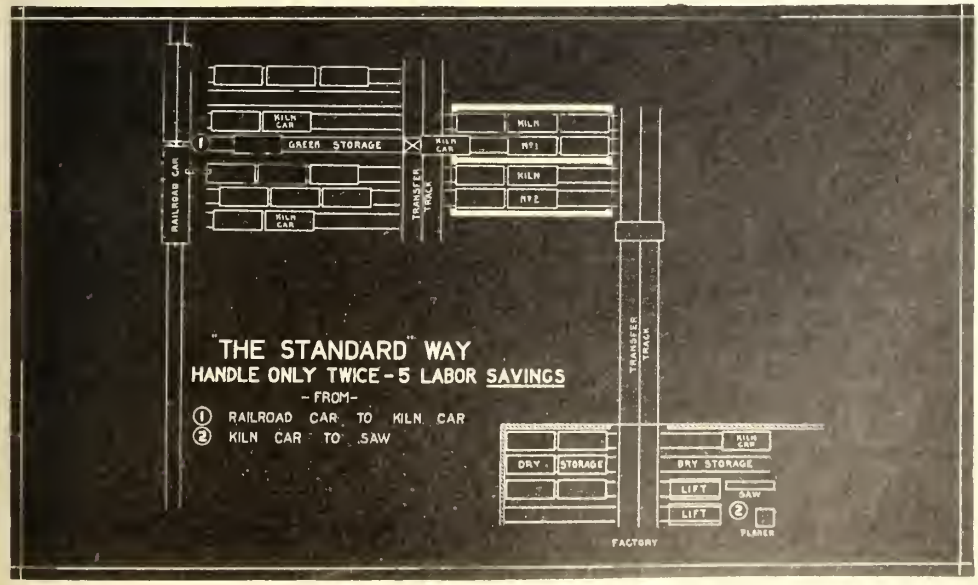
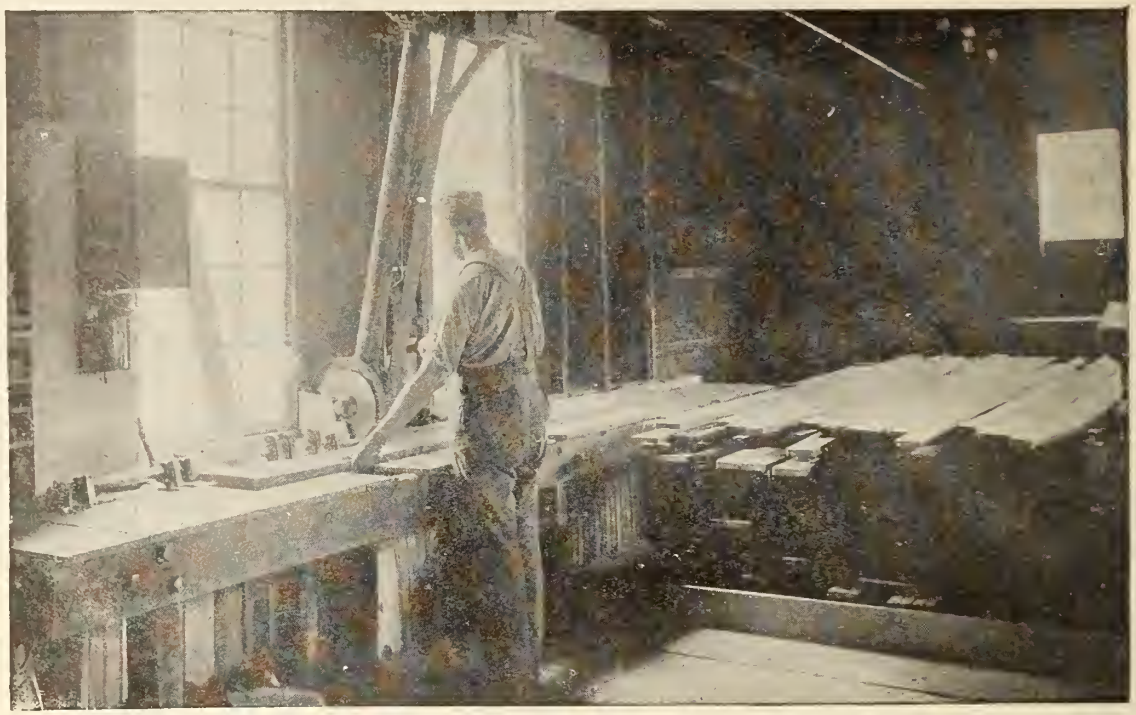


Fig. 2—How five handlings may be eliminated



This swing-saw operator can do more work because top of car is always at convenient level.

The lumber is allowed to equalize. This means that its moisture content from outside to centre balances even better than it did in drying, and any defects along this line in drying may be overcome. Consequently the boards upon being resawn are in less danger of cupping. Joints and grooves do not swell when fresh surfaces are exposed to the air. These advantages show up throughout the plant in the many other operations which follow the drying. Glue joints hold. Closely machined pieces fit when matched in other portions of the plant after several days' standing. Many troubles in the varnish room, which would be traced to the lumber, are eliminated.

Having a dry storage track also enables the loaded car to be taken from that point and run it on to a lumber shift, as shown in Fig. 2. This eliminates another handling at this point because the boards are left on the kiln trucks. The entire car is not unloaded onto a flat pile at the saw. This handling is saved and in addition, you gain the increased speed that comes when using a lift. You also eliminate the helper who hands down the boards from the top of the loaded car—because the top of the car is now lowered to the height of your saw table. The lift is a sort of elevator platform, having rails onto which the kiln car is pushed. It is then lowered; that lowers the kiln car of lumber until the top course is at any point desired. The man at the saw can pick off the boards himself and he does it with less effort than under the old system because they are always at the same level. As he takes off one course, he pushes a button and the lift raises the load one course at a time. Therefore, the handling which the man at the saw does is only the second handling in the whole course of each individual board "from car to saw".

It does not require a large plant to make use of the advantages suggested above. The layout for the Canadian plant of Langslow, Limited, Cobourg, Ontario, gives an idea which can be adopted by most plants. For those using end piling, the other illustration shows possibilities. Both show the relation between kiln capacities and storage capacities suggested for plants of that size.

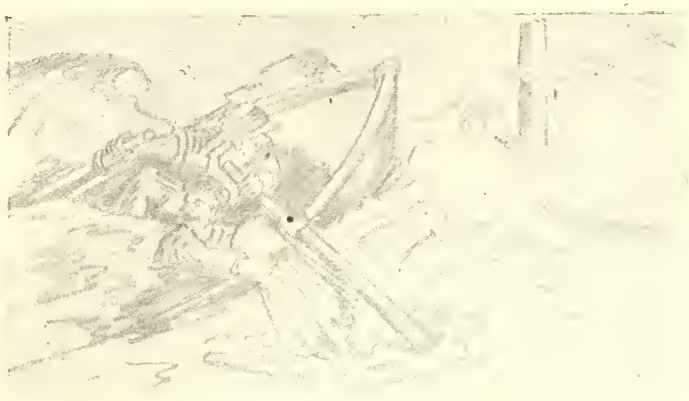
The numerous ways in which such a system effects savings are apparent to anyone applying the ideas in these sketches to his own plant. A large surplus of air-dried stock in unnecessary. This does away with a heavy investment in lumber, reduces insurance and risks when large stocks are carried. It makes it possible to get the oldest lumber into the kiln first. It enables different kinds and thicknesses of stock to be separated, which means better drying and less losses in the kiln. If no other saving resulted than the saving in re-handling the lumber, running as it does anywhere from 50 cents to four or five dollars a thousand, this alone would justify the installation of the simple system of storage tracks and the general method of handling "from car to saw."

Our Front Cover Design

The illustration in the centre of the front cover is particularly appropriate in view of the special character of this issue. It shows a mechanic in the plant of the Brunswick, Balke, Collender Co., Toronto, fitting the doors on phonograph cabinets. How much better and quicker is this than the old method of fitting with a hand-plane. In some plants a disc sander is used for fitting doors and drawers but the edge sander, with straight steel plate behind belt, is much more suitable. This is just one illustration of what "modern methods" mean.

One of these days circular and other saws will be made of such tough metal that cutting a 6 in. nail will not affect the sawing any more than cutting a knot.

Bailing a Boat vs. Operating Dry Kilns



Air is Vehicle for Bailing Moisture from Kiln—Emphasizes Need of Adequate, Uniform Circulation—Some Points Worth Watching

By Thos. D. Perry*

The bailing of a leaky boat is familiar to everyone and it is easy to make a mind picture of the number of "pails-full" that would be required to empty the boat. It is only a little harder to imagine bailing a boat with something porous and absorbent like a sponge, and it would be possible to compute the number of "sponges-full" of water contained in the boat.

Keeping this illustration in mind may help to make kiln drying a little more clear. In operating dry kilns the problem usually appears complicated and the principles obscure. Comparing with the boat, however, let us imagine that every cubic foot of air in a dry kiln is contained in a sheet metal cube so that it could be handled the same as a "pail-full" of water in bailing the boat. Air is absorbent, something like a sponge, and will carry water in the form of vapor. Ascertaining the total number of cubic feet of air in a kiln is easy. Tabulations tell us that each cubic foot of air will carry so many pounds (or fractions of a pound) of water vapor depending on the temperature, and the air in the whole kiln would hold a definite quantity. In order to remove any given amount of water (in the form of vapor) from the lumber in the kiln we would have to fill and empty the kiln with air a stated number of times.

Table Giving Absorbing Power of Air

Temperature	Weight Water Vapor in one Cubic Foot of Air
Fahrenheit	Grains	Pounds
50	4.08	.0006
60	5.75	.0008
70	7.98	.0011
80	10.94	.0016
90	14.72	.0021
100	19.76	.0028
110	26.11	.0037
120	34.11	.0049
130	44.09	.0063
140	56.41	.0081
150	71.51	.0102
160	89.76	.0128
170	111.71	.0160
180	137.89	.0197
190	168.85	.0241
200	205.37	.0293

From tables by Grosvenor and Goodenough

7000 grains = 1 pound avoirdupois

Moisture Absorbing Power of Air

The application of the tabulation used in the operation of dry kilns requires the observance of such variables as temperature and humidity, but the purpose of the above simile is to show the absolute necessity of a positive circulation of air in a dry kiln. The absorbing power of air varies with its temperature, from 4 grains per cubic foot at 50 degrees to 205 grains at 200 degrees as shown by the accompanying table:

The three important variables in dry kiln operation are circulation or ventilation, temperature or heat, and humidity. The third in a dry kiln is the humidity and it can be compared to the brake on a vehicle, because it is the retarding element that prevents too rapid drying of the surface of the lumber and keeps the surface of the lumber soft and plastic while moisture is coming out from the centre of the boards.

Natural Movement of Air

It is not the purpose of this article, however, to discuss the problems of heat and humidity, even though they are of sufficient importance enough to warrant it, but rather to emphasize the need of adequate circulation. The short comings of most dry kiln operators and the mechanical deficiency of most dry kilns lie along the line of inadequate ventilation.

Nature provides the force of gravity which when properly used will give all the power and speed necessary for ventilating lumber during the drying process. In other words the cubic foot of air illustrated above (if not saturated) will absorb moisture; as it absorbs moisture and drops in temperature it will have a tendency to settle lower and lower in the kiln. Eventually this cubic foot of air will arrive at the lowest point in the dry kiln, which should be considerably beneath the rail line, and from there proper means must be provided to release the air and lift it out through stacks or chimneys. A kiln with outlets at the bottom conforms more nearly to scientific facts in the removal of used kiln air than any other type of drying apparatus.

Why Circulation is so Important

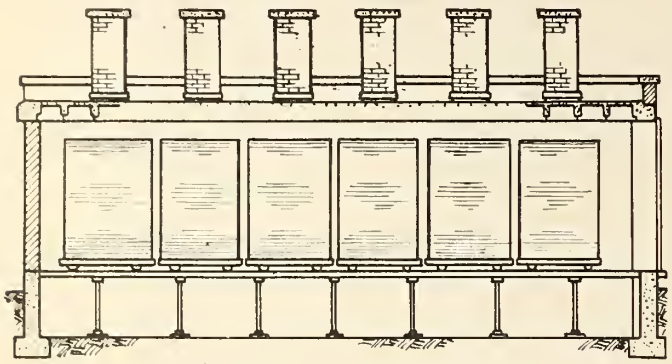
It is not easy to visualize the amount of water which must be removed from lumber. Suppose we take as an example 20,000 feet of gum lumber of 25% of moisture content and wish to reduce this to 5%, removing of 20% of moisture based on the dry fibre weight. Gum lumber (ovendried) will weigh 2250 lbs. per thousand. 20% of this is 450 lbs. water to be removed per thousand feet. The total weight of water when removed would be 450 x 20 or 9,000 lbs. or 144.3 cubic feet, requiring a square tank 6'0" x 6'0" and 4'0" deep, to hold it. This is equivalent to 1800 gallons or 36 barrels of 50 gallons each.

A kiln holding 20,000 feet of lumber (40' L x 18' W x 10' H), of which a cross section is shown, in the

*Grand Rapids Vapor Kiln, Grand Rapids, Mich.

accompanying sketch would contain 7,200 cubic feet, above rail line; 20,000 board feet lumber makes 1,700 cubic feet and allowance for stickers and trucks would bring this to 2,200 cubic feet; leaving a net of 5,000 cubic feet of air to be used for absorption purposes.

Basing our computations on the 1/100 pound of water that can be carried by one cubic foot of air at



Showing proportion of air and lumber

150 degrees and using only half of this as the useful range(from 20% saturation to 75%) we find that we require 1,800,000 cubic feet of air to carry off this moisture. If the net cubic content of the kiln is 5,000 cubic feet it would require 900 complete changes of kiln air. Two air changes per hour would be 48 per day and require about 18 days, three per hour 12 days, and four per hour 9 days. This is a theoretical computation based on scientific facts and calculated to make the dry kiln operator realize the tremendous importance of adequate circulation in a dry kiln. Unless a kiln removes the water from the lumber it is utterly worthless.

Some Timely Suggestions

Frequently kilns are operated on higher humidities, perhaps using only a third or fourth (instead of one-half) of the saturation limit, in which case either the air interchange must be increased or the time lengthened.

Many men, who pride themselves on being intelligent kiln operators, ignore or neglect the proper ventilation of a dry kiln to an inexcusable degree, in fact some even advocate a hot box in which all air removal is by leakage. Often kilns are so neglected that the outgoing air stacks are filled with rubbish or the dampers are allowed to get out of order or the top of the stacks are not properly equipped with hoods or other weather protection.

A few practical suggestions to kiln operators are: 1. Always follow intelligently instructions of the makers of the type of kiln in use. 2. Keep kilns tight and in good operating order. 3. Regulate them as directed. 4. Appreciate the principles involved in the proper combination of ventilation, temperature and humidity..

What Comprises Breaking-out Department?

Most Important Section of Plant—Lumber, Which Means Money, May be Saved or Wasted in This Department—Organizations and Equipment of Prime Importance—Foundation of Whole Production System

By H. H. Poole

It may seem peculiar to profound the question,—"What constitutes a breaking-out department, but a moment's consideration will serve to indicate that there is more to this query than at first appears. Not that it is important to make a clear distinction between the breaking-out department and machine shop proper, but where does the breaking-out section end and the machine department start? Often when conducting a visitor through a plant, the manager or superintendent will indicate a few saws with a wave of his hand and state that this is our breaking-out section. It is doubtful if the speaker himself has a clearly defined idea of what he means.

Before we attempt to outline what might constitute an up-to-date breaking-out department, it might be well to attempt a definition. The purpose of this part of the plant is to prepare the stock for planing, shaping, sticking and other operations in the machine room proper. If this outline is accepted, the equipment of the breaking-out department would include, in addition to swing cut-off and rip saws, a buzz planer, edge jointer, clamping devices, dimensioning saws and perhaps a resaw. We will discuss this department in the light of the broader definition.

Lumber Lift Reduces Handling

As the breaking-out might be termed the neck of the bottle through which all the raw material flows, the provisions made for facilitating the handling of lumber are of prime importance. In the modern plant we find the stock is run in from the dry storage on the kiln cars. As a loaded truck reaches the breaking-out department, it is placed on a lumber elevator, situated convenient to the first machine. Ordinarily the top of the car of lumber is above the head of the machine operator, necessitating the assistance of a

Straight-edging and jointing saw in breaking-out department of Bell piano factory

helper. This is not any too satisfactory, and, in addition, helps to run up the handling costs. Using a lumber elevator, the top of the car is always kept at a con-

venient height, and the operator is enabled to size up each piece and select the one best suited to the cut he wants.

The first operation may be either cutting off on the swing saws or rough surfacing on a planer. Some manufacturers make a practice of surfacing all the material before it goes to the swing saw. This applies more particularly to the better classes of wood. When this is done, the swing saw operator can work faster because he is able to see every defect at a glance and can also cut the material with a minimum loss from waste and the stock may be matched to much better advantage. If this practice is followed, the dressing is usually done on a double surfacer. In that event the lumber lift would be situated in front of the planer.

How Stock May be Handled

The latest development in swing saws is one in which an electric motor is mounted at the lower end of the frame and the saw attached directly to the motor arbor. This means a beltless machine. A swing-saw with motor mounted overhead is a common installation. Whatever type or make of swing saw is used, it should be fitted with automatic stops. These are saving time, labor and stock in numerous factories.

When the material leaves the swing saw, it is roughed to width. In this operation the power-feed rip saw, either chain or spur-feed type, is replacing the hand feed variety. The power-feed machine does more work with fewer operators and with less effort on the part of the machine men. As a rule one power-feed machine will replace from two to three of the older type rip saws.

The stock is now ready for straightening and further machining or jointing and gluing up. Here again our feed equipment effects a saving. Large undercut planers or jointers with overhead feed works or ordinary type jointers with special overhead feed attachmente are cutting costs and increasing production in many plants. These machines are capable of handling a large volume of stock during the course of a day. The safety features of the finger planer or flattener, as some call it, are worthy of consideration.

Labor Saving Production Equipment

The modern type of edge jointer is a continuous chain feed machine in which the stock is passed along one side and back along the other. By using special heads, all types of glue joints, with the exception of the dovetail joint, may be made. When in connection with the productive clamp carrier, the two form a production combination which is hard to beat. When the glued stock is removed from the clamps, it may be run through the power-feed straightener and then moved along into the machine room proper.

In view of the above, our modern breaking-out department would be equipped with lumber lift, swing cut-off saws, power-feed rip saws, undercut planer, continuous feed glue jointer and a set of revolving clamps. These machines should be so arranged that the stock moves forward as each operation is completed. The idea of having the swing cut-off saws and ripsaws arranged in groups as described elsewhere in this issue in the article on the plant of the North American Furniture Co., Limited, Owen Sound, is a good one. Each group handles one particular class of work, enabling the operator to become a specialist in cutting a certain kind of stock.

Importance Not Fully Realized

There is more to this department than its equipment. It must be so organized and manned by trained men that the work will go through without confusion and delay and so that all the stock will be worked up with a minimum of waste. The organization of this department might well start in the lumber yard. It is necessary that some accurate check be kept on the lumber in the yard and that somebody be made responsible for maintaining sufficient seasoned lumber in the dry storage room to take care of all the orders as they come along. This requires close co-operation between the management, which has a check on the different items in the finished stock room through some simple perpetual inventory system and also a check on the orders in hand, and the man responsible for the supply of dry raw material.

It might be well to emphasize the necessity of having trained, intelligent men in this department. While the operation of the swing cut-off saw may not call for a very high degree of skill, yet judgment of a rare order is required for selecting the cuts and

Spur or power feed rip saw is found in many plants

working the stock to the best advantage. Instances are not lacking where a swing cut-off operator who was interested in his work had cut twice as much material from the same amount of lumber as had a careless operator. A careful check should be kept on all lumber going through this department. A standard maximum waste allowance might be figured out and the operator given credit for all savings effected below this figure and penalized where the waste exceeded the maximum allowance.

This department plays a bigger part in the efficient operation of a furniture manufacturing plant than most factory managers realize. It is the very foundation and heart of their whole production system. Any weakness or looseness here will be reflected throughout the whole organization.

If the new year has come without you making any resolves, then start at once and make this one, that you will use the saw guard over the saw, not put it on a nail in the wall. When a man has a band saw break, and a piece flies within a half-inch of h's nose, he realises that a wire guard over the wheels and a plate at the side of the saw is of some real use.

J. R. Shaw,
Canada Furniture Manufacturers,
Woodstock, Ont., Director.

James Malcolm,
Andrew Malcolm Furniture Co.,
Kincardine, Ont., Director.

George J. Lippert,
Lippert Table Co.,
Kitchener, Ont., Director.

J. S. Knechtel,
Knechtel Furniture Co.,
Hanover, Ont., Director.

D. M. Wright,
McLagan Furniture Co.,
Stratford, Ont., Director.

"Play the Game Hard" but "Play the Game Fair"

Furniture Manufacturers' Association Holds Two Day Meeting—Many Practical and Instructive Addresses—Reports of Different Committees—Factory Managers, Superintendents and Foremen Have Interesting Session

With the above caption for a motto the furniture manufacturers of Canada are away to a good start for 1922. This is the slogan adopted at the well attended annual meeting of the Furniture Manufacturers' Association which was held in Toronto, on February 1st and 2nd. A new departure was made this year when the sessions of the first day were thrown open to the factory managers, superintendents and foremen for a discussion of their problems and for the presentation of interesting and instructive addresses on subjects pertaining chiefly to their fields.

In opening the meeting, the chairman, J. H. Baetz, touched on the vast strides which had been made by the furniture industry during recent years. The day of individualistic, selfish, for-myself-only effort is past. To-day's conditions require co-ordinated effort to overcome difficulties and to advance the furniture industry. To appreciate the great improvement made during recent years in the furniture industry, Mr. Baetz intimated that one had but to come to this meeting of managers and superintendents, listen to the addresses to be made and the discussion to follow; then if one can leave, feeling that these meetings are of no benefit, that our old selfish individualities still are as strong as formerly or that combined effort can accomplish no great good, then indeed our case is hopeless. "Speaking for myself," he continued, "I believe that our industry has made remarkable progress during the past seven or eight years; for instance, would it have been possible, even ten years ago, for a meeting such as the one of to-day in which we are gathered together to discuss improved methods for our industry and to listen to instructive addresses on practical subjects, not as individual manufacturers but as members of an industry having as our object the betterment of conditions in the industry."

Wm. Krug,
Krug Bros. & Co.,
Chesley, Ont., Chairman.

J. A. Minchner,
North American Furniture Co.,
Owen Sound, Ont., Vice-Chairman.

The first speaker to address the meeting was F. C. Lovett, of the Canadian Accident Prevention Association. Mr. Lovett dealt largely with the responsibilities for the many accidents which occur in the furniture industry. He thought that a large part of the responsibility rests upon the shoulders of the foremen and superintendents, also that the management should take their share of the blame. Of all the accidents which occur, fully 90% are preventable. During 1920 over 300 accidents took place in the furniture industry. The cost of these to the furniture manufacturers was in excess of $40,000.

Safety work is one of the most important phases of industrial activities. Accidents are unnecessary and it is for the superintendents and foremen to take a hand in instilling that thought into the minds of the employees. The foremen should see that safety devices are provided and used, but this is not enough. Safety appliances will only prevent 25% of the accidents. The men should be given thorough instruction covering the dangers of operating the machine at which they labor. If they do not

William Cawkell,
Toronto, Secretary
Furniture Manufacturers' Association

take full advantage of the safety appliances provided, it does not shift the onus of blame. If a workman will not carry out the instructions and play safe, he should be dismissed. The aim of all those in authority should be to prevent accidents, saving life and limbs and the management in our factories are the ones who should be the most interested.

Training Course Discussed

Mr. Lovett was followed by James E. Ferguson, of the Cost Accounting Department, who gave an outline of the scheme of training drafted by the special Training Course Committee. The question of future supply of skilled mechanics is a pressing one. The elegible raw material from which skilled workmen may be developed was being attracted by

W. J. Anderson,
Stratford, Chair Co.,
Stratford, Ont., Director.

other industries which offered a higher rate of remuneration. To counteract this a special course of training for apprentices is being developed. At the present time the first series dealing with cabinet-making is being worked out. It is believed that this work will be of great benefit to the furniture industry. While cabinet-making is being tackled first, if the course is found to work out successfully, it will be extended to other phases of furniture work. (This scheme was outlined in the January "Canadian Woodworker.")

A short treatise on the various adhesives used in the furniture industry was presented by W. J. Feldkamp, of the Canada Glue

H. M. Snyder,
Snyder's Limited,
Waterloo, Ont., Director.

Co. Brantford, Ont. Mr. Feldkamp dealt with animal, liquid and vegetable glues, explaining how they are manufactured and used. In describing the various processes through which animal glue passes, he showed samples of the raw material in different stages of manufacture. Hide glue, which is the highest quality animal glue made, is produced from the fleshings and cuttings taken from raw hides, while bone glue, is as its name implies, made from bones. To-day glues are tested and graded according to certain definite standards. The manufacturer of glue aims at uniformity of grades so that a woodworker buying a certain grade of glue can be assured of the same quality in each batch received.

Vocational or Part Time Schools

After the noon adjournment the discussion on technical training was resumed and a motion approving the efforts of the Labor Committee was unanimously carried.

Dr. Merchant, head of the Industrial and Technical Education Branch of the Ontario Board of Education, gave an interesting and instructive talk dealing largely with part time and vocational training. He stated that the resources of Canada, vast as they are, are worthless unless developed by human hands and human brains. The skill and knowledge necessary to take advantage of these raw resources, can either be developed in coming generations or we can import the necessary skill and learning from other countries. His department is endeavoring to provide proper education for our boys and girls to bridge over the gap between our day schools and our industrial and technical requirements. The passing of the old apprenticeship system has tended to throw more work on the technical school. There are some things which can be taught best in the schoolroom while other phases of the work can only be taught advantageously in the factory. This has led to the development of what is known as the part time school in which the pupil spends so many hours at school and so many hours in the plant. The policy of the department is to work with employers of labor and to try and meet the requirements of industry. He further stated that his department was in a position to, and was anxious to work with any industry which felt the need of imparting specialized training, covering the requirements of that particular field in an effort to develop boys capable of taking their places in that industry.

An interesting address on "The Kiln-Drying of Lumber" was given by Thomas D. Perry, of the Grand Rapids Vapor Kiln, Grand Rapids, Mich. This was illustrated by lantern slides. Mr. Perry intimated that we had only begun to delve into the science of drying lumber artificially, but that a few fundamental facts were available on which to base our methods and theories. Lumber should be dried so as to relieve all internal strain, reduce shrinkage and secure a un-

W. Gray Hay,
North American Bent Chair Co.
Owen Sound, Ont., Director.

form moisture content. Steam is employed largely to equalize the moisture content, relieve strain set up during air-drying and to heat the lumber equally and uniformly. The most important considerations in the artificial drying of lumber are heat, humidity and circulation. Lumber is dried not so much by warmth of the air as by the thirst of the air for moisture. Of the three factors mentioned, circulation is, probably, the most important for unless the moisture-laden air is removed and replaced by air having a lower relative humidity, the moisture cannot be removed from the lumber. The different types of kilns, such as blower, gravity and condensing types, were touched on briefly. One of the most important considerations in dry kiln operation was the piling of the stock. It should be piled so that the air will have free access to all parts of the pile and so that the boards, including the ends, will be well supported by stickers. Unless this latter suggestion is followed, considerable warping and twisting is apt to occur. Mr. Perry closed with a reference to the keeping of dry kiln records. He thought it highly advisable for every manufacturer to insist that records be kept. In this way if trouble occurs, a reference to the record for that particular run will, probably, show where the trouble lay, and suggest means for preventing its re-occurrence.

Reports of Various Committees

The business session of the general meeting was opened on Thursday morning. After the members were called to order, Mr. Cawkell, the secretary, presented the chairman with a mahogany gavel. Following this a communication was read from the secretary of the Retail Merchants' Association, asking the furniture manufacturers to pay more attention to the stamping of numbers and other indentification marks on their furniture, the dealers often having considerable trouble in ascertaining the number or identity of certain pieces of furniture.

A. Ford,
Interior Hardwood Co.,
Kitchener, Ont., Director.

G. A. Gruetzner,
Hespeler Furniture Co.,
Hespeler, Ont., Director.

The retiring chairman, J. H. Baetz, then delivered an inspiring address reviewing the work of the Association and conditions in the industry. This appears elsewhere in this issue.

In the secretarial report, Mr. Cawkell thanked the chairman and members of the various Committees for the support they had tendered during the year. He also complimented the association upon the good attendance at the numerous meetings held throughout 1921, a large number of manufacturers attending ten meetings or more, while fourty-four manufacturers attended four or more meetings. The finances are in a healthy condition, the year showing a surplus. The expense of fitting up the new offices has been completely written off.

Credit Section Does Good Work

The report of the Credit Committee was presented by the chairman, Mark Rowe. Mr. Rowe considered that the members of the Furniture Manufacturers' Association had every reason to congratulate themselves on the very small percentage of losses sustained by the membership during the past year. This was in no small measure due to the services of the "credit section." He suggested that they were not yet out of the woods but were facing another year of strenuous effort. Commercial failures during 1921 numbered 2,451 with total liabilities of $73,299,111. This was a record for Canada, the next highest total being $41,000,000. of liabilities in 1915. The credit bureau was exceptionally active during the year, as witnessed by the large number of reports issued. He was of the opinion that the credit section was one of the most valuable assets of the Association.

The labor situation was covered by James E. Ferguson, in a brief report dealing with labor conditions, also with accidents and other similar matters.

D. E. Macintyre,
North American Furniture Co.,
Owen Sound, Ont., Director.

Importance of Cost Knowledge

Mr. Ferguson also presented the report of the Cost Accounting section, dealing with the work of that department in extending knowledge of factory costs, which knowledge must always form the basis of proper control of business activity. The report covered prices on material entering into furniture, cost of furniture and by means of drafts and charts, the speaker was able to show the trend of general commodity and raw material prices.

The report stated that certain

sections of the furniture industry have suffered severely and goods have been sold at prices which bear no relation to costs. A continuation of this policy, if it can be called a policy, will eventually pull the whole industry down to a non-profit level. Regrets and

F. W. Trebel,
Kindle Bed Co.,
Stratford, Ont., Director.

good intentions are not recorded in the profit and loss statement, and unless facts are faced squarely, there will be many statements which will not afford much satisfaction. In the past our industry has been slow to respond to improvements in general conditions. Now is the time in the new cycle, to avoid errors of the past.

It is gratifying to report that some members have applied themselves whole-heartedly to the problem of cost reduction, and it would be a lasting benefit if everyone would take steps to examine all factory operations. Cost knowledge is absolutely necessary to any industry. It is the keystone of the whole structure, and once this knowledge is acquired, the problems of sales and profits become less formidable. Our hope is that during 1922 there will be an extensive and truthful examination of all costs and that there will be a real re-adjustment on a profit-making basis. If our costs take care of all elements of material, labor, overhead and a reasonable profit added, our price position is unassailable.

Mr. Cawkell on behalf of the Better Merchandising Committee, stated that this committee was only appointed in November. It had for its object the overhauling of the whole selling machinery which was such a powerful factor for weal or woe in the furniture industry. As a whole, the furniture manufacturers are not skilful salesmen and in this respect might learn a great deal from the retail furniture dealers who with a pro rata investment very much lower than that of the makers of furniture, are able to turn their capital over four to five time each year, while the manufacturers only turn theirs once. Meetings of this committee will be held frequently and a strong effort will be made to improve selling conditions.

Officials and Committees

The following officials were elected for the ensuing year:—

Wm. Krug, Krug Bros. & Co., Limited, Chesley, Ont., chairman; J. A. Minchner, North American Furniture Co., Limited, Owen Sound, Ont., vice-chairman.

Executive Committee:—W. J. Anderson, J. H. Baetz, J. E. Campbell, G. A. Gruetzner, P. R. Hilborn, J. S. Knechtel, James Malcolm, J. R. Shaw, H. M. Snyder, E. O. Weber, D. M. Wright, High-grade section,—D. E. Macintyre; Medium, L. Malcolm; Lower,—J. J. Spiesz; Table, George J. Lippert; Chair, W. G. Hay; Upholstering, W. Trebell; Office Furniture, H. Ford; Filing Cabinets, F. E. Mason.

Labor Committee:— W. J. Anderson, J. H. Baetz, James E. Ferguson, P. R. Hilborn, J. S. Knechtel, G. A. Gruetzner, D. E. Macintyre, A. Malcolm, A. H. Smith, H. M. Snyder, J. J. Spiesz, A. H. Watson, D. M. Wright.

Merchandising Committee:— J. H. Baetz, W. Cawkell W. E. Dolan, J. S. Knechtel, D. E. Macintyre, James Malcolm, J. McPherson, J. Orr, E. O. Weber, D. M. Wright.

Purchasing Committee:— W. J. Anderson, W. G. Hay, P. R. Hilborn, E. O. Weber.

Credit Committee:— M. S. Armstrong, W. J. Fleischaeur, James Garvie, R. Gomery, J. H. Kennedy, E. R. Purple, L. J. Salter, J. McPherson, Mark Rowe.

Tariff Committee:— R. J. Ball, Thomas Dillon, G. A. Gruetzner, O. A. Keffer, J. H. Kennedy, H. R. Magwood, N. Peppler, W. T. Sass, W. T. P. Seyler, I. Wegenast.

Transportation Committee:— J. Bailey, F. E. Coombe, W. G. Durst, C. Gruetzner, W. G. Hay, J. H. Kennedy, C. McMurtry, S. Taylor, F. W. Trebell, J. H. Weolner.

William Cawkell, Toronto, Secretary.

Chairman Asks for Active Co-operation

Upon the new chairman, Mr. Krug, taking the chair, he was presented with an attractive gavel to assist him in maintaining order at the various meetings over which he will preside. In a brief address he thanked those present for the signal honor they had conferred on him, and asked for the full support and active co-operation of every member of the association. He realized that a big task confronted him in attempting to fill the place of the retiring chairman, but with the full support of all members, he would do his best.

An interesting miniature model of the Sturtevant forced circulation dry kiln was on display in charge of Mr. K. Redman, of the B. F. Sturtevant Co., Boston, Mass. Mr. Redman delivered a short address dealing largely with the necessity for an adequate uniform circulation, and pointing out how this was obtained in the Sturtevant kiln. By means of a blower system heating coil and properly-designed ducts, the air was carried

F. E. Mason,
Globe Wernicke Co.,
Stratford, Ont., Director.

to all parts of the kiln and forced up through the centre of the piles, wiping each side of every board. In this way uniform and rapid drying was secured.

The meeting was then turned over to the Home Furnishings Bureau, when J. G. Gronberg, of

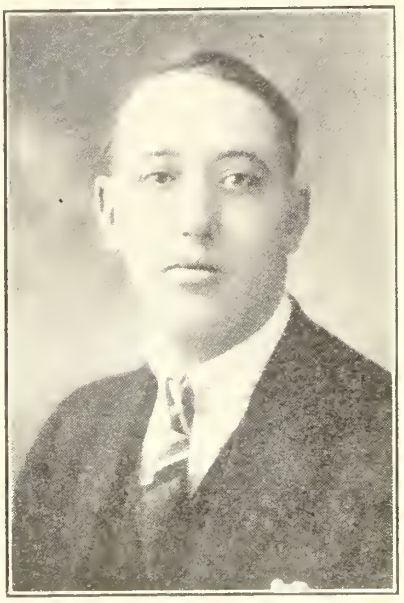
(Continued on page 162)

Foundation of Economical Production

J. E. Alain, Victoriaville, P.Q.
Vice-pres. and general manager

Sectionalizing of Departments Adopted by Victoriaville Furniture, Limited

Economical Advantages of Distributing Work in such a Way as to Ensure Maximum Output at Highest Efficiency



Geo. Cantin, Victoriaville, P.Q.,
Secretary-treasurer

In the final analysis, economical production is based on system—on methods designed to secure the maximum of output at the lowest cost, and to eliminate the many leakages so apt to occur, and which, small in themselves, in the aggregate, constitute a very important item in the cost of manufacture.

Such a system cannot be of a castiron character. Furniture factories, for instance, vary so much in size and in output that it is impossible to rigidly apply one method to every factory—there must necessarily be a certain amount of individuality in the application of a system. Location, sources of supply, proximity of market, and labour enter into the cost of production. But the great determining factor is the co-ordination of the work of every department under a plan which has for its object the economical production of the particular commodities produced by a given factory.

In the olden days of the industrial boom, the tendency was frequently to overlook the leakages referred to. Firms were making large profits, and the ever-growing expenditure was a matter for casual remark rather than for the adoption of drastic measures of retrenchment. Those days are over, and the close competition in almost every line of business has compelled greater attention to the question of reducing the cost of manufacture by the application of cost accounting and other systems.

Sectionalizing of Departments

One of the most important elements of factory management is the sectionalizing of departments, by which these are divided into sections and the men engage in definite operations. By this method workmen become very efficient in their particular work, by reason of the fact that they are employed on it, and it alone, month after month. This is the system which is adopted at the factory of the Victoriaville Furniture, Ltd., Victoriaville, P. Q. Founded in 1894, the Company was formerly known as the Victoriaville Furniture Company, Limited. In 1920 the Company was re-organized, and in March of that year was purchased as a going concern by Mr. F. Canac Marquis, of Quebec, who is President; Mr. J. E. Alain, Vice-President, and General Manager; and Mr. G. Cantin, Director and Secretary-Treasurer.

The main part of the Company's business for many years was the manufacture of medium grade case goods in surface oak. A radical change of policy has been decided on and is being carried into effect. The Company is now making solid walnut, quarter oak, birch, walnut, and surface oak furniture. The directors, in making the change, are of opinion that the Company possesses advantages which will make for success—a well-equipped factory, proximity to market (it is intended to devote special attention to Eastern Canada), cheaper freight rates as compared with other and more distant plants, economical manufacture, and a good supply of labor at wages which are not so high as in some other furniture making centres. The company has also the advantage of owning timber limits and sawmills. The limits, of 5,000 acres, contain principally birch, and are situated, with one mill, at Paul de Chester, fifteen miles from Victoriaville, the other mill being at Notre Dame de Ham. To use the words of Mr. Alain, the company is in a position to make furniture from "tree to crate."

Changes and Improvement to Plant

In entering upon the manufacture of a better grade of goods, the directors have made alterations in the plan of factory management, and in the arrangement of the departments, with a view to securing the utmost efficiency. The work has been more thoroughly systematised and greater attention given to certain details as to the routing of work, etc., so that the company starts with a clean sheet, so to speak, in the manufacture of the new lines of furniture.

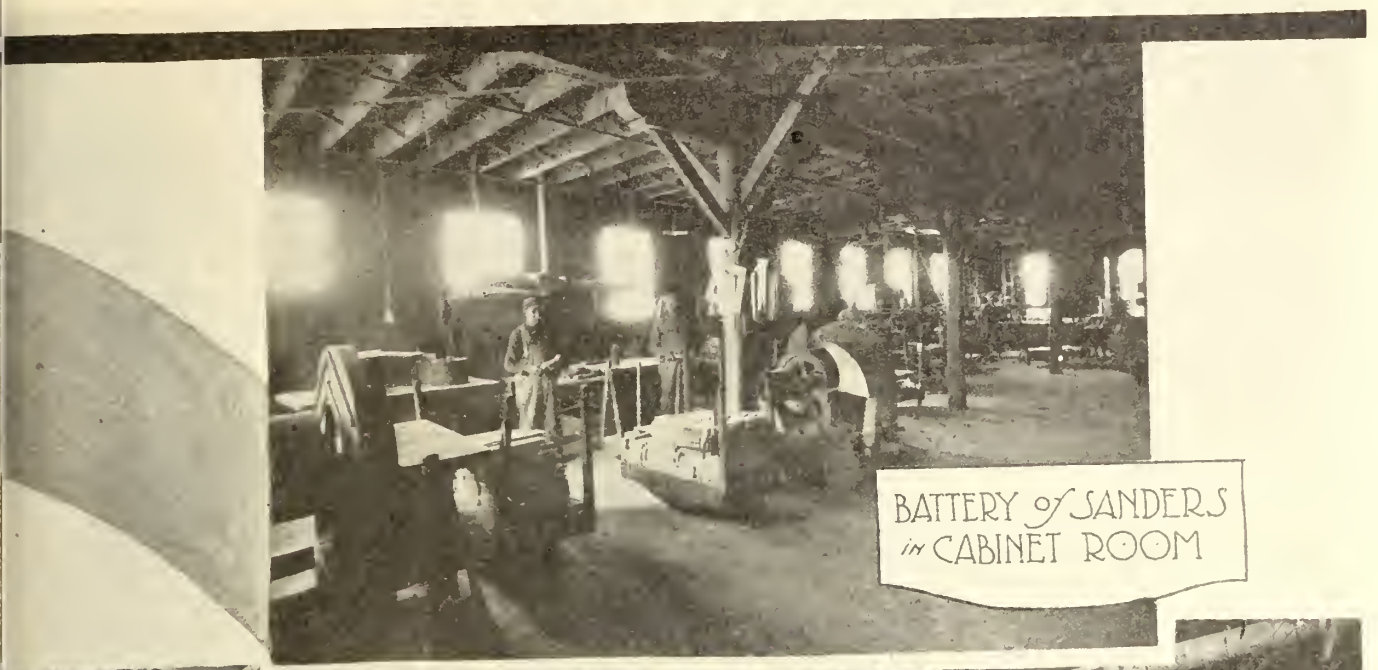
All the furniture is designed by the staff of the company. In addition to the detail drawings, rods for factory use are made. These rods are of clear basswood, and are given castings of shellac and of varnish. They show the full size of the pieces, eleva-

GENERAL VIEW OF PLANT OF
VICTORIAVILLE FURNITURE LIMITED
VICTORIAVILLE P. Q.

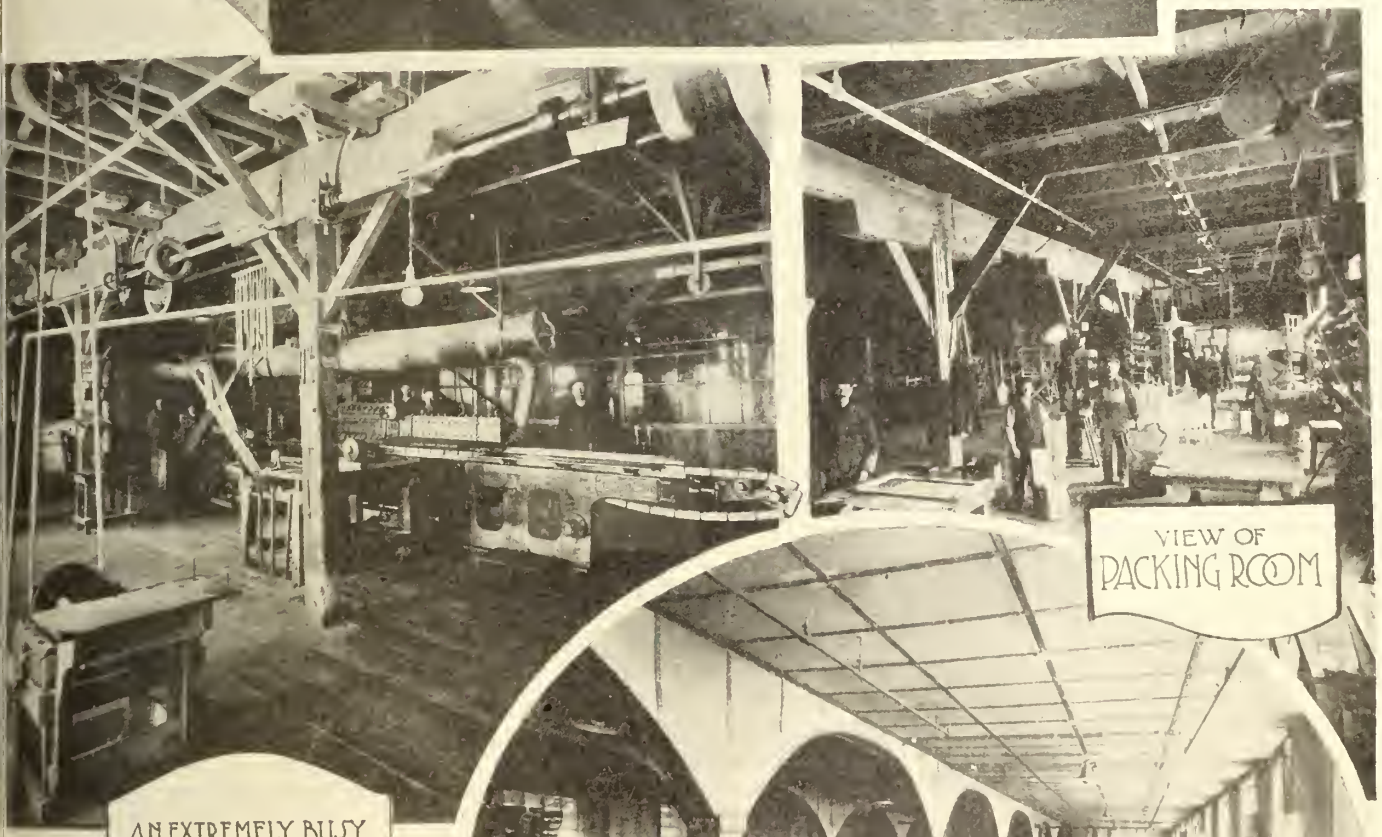
AIR SPRAY EQUIPMENT IN SHELLACING SECTION

MILLWRIGHT & REPAIR DEPARTMENT

ASSEMBLING DEPARTMENT SHOWING SPECIAL CLAMPS



BATTERY of SANDERS in CABINET ROOM



VIEW OF PACKING ROOM

AN EXTREMELY BUSY MACHINE
The LINDERMAN

FINISHING ROOM
WITH SPRAY EQUIPMENT IN BACKGROUND

tion and width, cross-graining being in red and blue markings. Every piece shown on the rod is numbered and indexed—as for example—1, top; 2, front parts; 3, back parts; 4, gables; 5, front rails in frame; 6, back rail in frame, etc. The rod accompanies the job through every department, and is so explicit in its character that a mistake as to the details of the work is almost impossible. Its labor-saving quality consists in the fact that it supplies the workman with all the information necessary, and obviates waste of time in seeking instructions from the foreman.

Three stock bills are used—one for the office, one for the superintendent, and one for the break-out man. The index number on the stock tag corresponds with that on the rod index, so that a workman by looking at the rod can at once obtain full details of the piece referred to. Besides this, the tag contains on the back a list of the machines to which the

STOCK TAG

VICTORIAVILLE FURNITURE LIMITED

JOB NO. ARTICLE CAT NO. QUANTITY

NO. OF PIECES

DESCRIPTION

FINISHED LENGTH WIDTH THICKNESS

ROUGH

INDEX KIND OF WOOD

Note :-This Tag must follow this article through every operation.

Date 192

Tag used for routing work

piece must go. The tags are of red and white cardboard, the red being for special orders. They are made out in the general office and are checked over by the superintendent before being sent to the factory.

Equipped for High Production

About 125 men are employed in the factory, which consists of a ground floor and two storeys. It is a well-lighted building with a floor capacity of 95,200 feet and is equipped with a sprinkler system. The lumber yard is of ample size, the company maintaining a minimum stock of a million feet. The kilns consist of four sections, with a total capacity of 100,000 feet of lumber. The kilns are on the moist air system of the National Dry Kiln Company, Indianapolis, and will accommodate 56 trucks. After being dried the lumber is conveyed on the trucks to the machine shops on the ground floor. In this department every piece or job is routed through in order, and at each operation the pieces are counted and sorted, this rule being strictly enforced. There are two elevators running from this floor to the top portion of the building. One elevator is used to take all the pieces up to the other floors, and the other, at the opposite end of the factory, to send down goods and pieces.

We need not describe in detail the various operations in the machine shop, where the work is prepared for the cabinet department. The machines include breaking-out and cut-off saws by MacGregor, Gourlay; Yates' self-feeding rip saws; automatic log lathe, by the Wood Turning Machine Company, Detroit; dovetailing machine, by the Advance Machine Works, Toledo; lock and keyhole machine, by the National Lock Company, Rockford, Illinois; and other machines by Cowan & Company, Galt, and the Canada Machine Corporation, Galt. Among the newer machines acquired is a lathe for Queen Anne legs, made by the Empire Machine Works, Mount Morris, N. Y. The company also operate a Linderman automatic jointer and gluer. The merits of this machine are too well known to be referred to at length, sufficient to say that it is regarded as one of the most efficient machines in the plant. Here and in other departments, trucks are used to convey the various pieces from machine to machine—these trucks have proved great labor savers, eliminating the loss of time involved in piling pieces on the floor and then removing them. It is more economical to spend money in purchasing trucks than in paying wages.

The repair shop and filing room is at one end of the machine shop. The company use chiefly the saws of Henry Disston & Sons, Limited, Toronto.

Well Arranged Cabinet Department

The cabinet department, on the next floor, is admirably arranged for economical production. All the benches and machines are arranged around the sides of the room under the windows, thus securing the maximum of light. The department is divided into three sections—sanding, assembling, and chair. In the first-named, two new machines have been installed. One, made in the factory, is for sanding Queen Anne legs, and the other by Chimmel-Reid & Company, Faribault, Minn. The various parts next go to the assembling section, where the idea of section work is carried out to the fullest extent. Thus all the gables are assembled at the gable clamp, and the cases at the revolving case clamp. The latter machine, by Jackson-Cochrane & Company, Kitchener, Ontario, will take a six-foot case. One man does nothing else but assemble drawers, another assembles toilets, a third makes dining tables only, while others are engaged in fitting the cases with drawers, doors, and so on—the work being so arranged that the men attain a high degree of efficiency from working for long periods at their special jobs. In place of a central glue kettle, each man has a glue kettle fixed above the bench, heat being derived from the boilers. This saves a considerable amount of time—it is in fact one of the small but effective changes which have been made in the factory arrangements. The surface oak goods are assembled in this section, after having undergone a printing process. The printing machine was supplied by the Grand Rapids Panel Company, Grand Rapids, Mich.

The machinery in the cabinet department includes a multiple boring and mortising machine by the Wysong & Miles Company, Greensboro, Carolina, three spindle borer, double borer, bed case clamp, and toilet case clamp. The latter was made in the factory and is controlled by hand wheels and screws, giving a uniform side pressure. It will take any size toilet case. In the chair section, the chairs are assembled and clamped. It might be mentioned that the company has in view a plan for supplying the cabinet-makers with tools especially adapted for the particular operations.

Finishing Department on Efficient Basis

From the Cabinet department the goods pass on to the finishing room, which is divided into five sections,—1, staining and filling; 2, sanding and shellacing; 3, varnishing; 4, rubbing and cleaning; 5, enamelling. The DeVilbiss air brush is used for shellacing, while in the varnish room another DeVilbiss sprayer is employed with excellent results. The company also use with good effect the Paasche pneumatic rubbing machine. Three coats of varnish are

(Continued on page 162)

We Should Consider Ourselves

"Directors of Furniture Industry"

Inspiring Address by J. H. Baetz, Retiring President of Furniture Manufacturers' Association—Day of Individualistic Effort Rapidly Passing—Outline of Various Association Activities

In presenting my report as retiring president of the Furniture Manufacturers Association of Canada, I wish first of all to pay a tribute to the officers whose whole hearted interest in the continued progress of this association has made possible, even during the difficult year through which we have just passed, the maintenance and improvement of the services which this association renders its members.

J. H. Baetz, Kitchener, Ont.,
Director and retiring president of Furniture Manufacturers' Association

It was a year ago that dire predictions were made that our association would not have strength to weather the storm of deflation; that members would again resume their individualistic selfishness and that the industry would slip back once more to the position it held seven or eight years ago. That these dire predictions failed is due in large measure to the broad gauge methods of our officials, and to the extension of our selves.

The day of successful individualistic effort may not yet be passed, but no one can successfully deny that it is rapidly passing, and that the day of co-ordination of effort and experience has dawned. The furniture industry in Canada, unfortunately, had largely gone the way all industry employing craftsmen, and those industries relying mainly on machine production had benefited at our expense, until the present organization was formed some eight or nine years ago. Since that time continuous progress has been made. Service after service has been inaugurated, until our members realize that the small cost of maintaining our organization is often paid for in the service rendered by one branch alone. If we can, in maintaining our association as an efficient organization, make the furniture business a staple, well maintained business, then we can feel our business is worth 100 cents on the dollar and one that would not have to be discounted from 50 to 75 per cent., as has been the case in the past, when the organizer of the business passed to his reward, or the business was sold to other interests. This phase alone is sufficient reason for maintaining our association as an efficient body.

Day of Co-ordination of Effort

But the day of co-ordination of effort is here. By considering ourselves not as individual furniture manufacturers, but as members of the furniture industry, who meet at our association offices as directors of the industry, further great progress can be made. More efficiently operated factories, better furniture, more artistic designs and more practical finishes, can be arrived at by exchange of information. Better marketing of our products and creating a demand for our products is another phase of this effort to really establish our industry as a basic industry of Canada, and one which can be accomplished only by co-ordination of effort, such as this Association provides for.

We can recall without any effort, because the changed conditions came about during the same time as the progress of our association, the improved roads in our province. Probably all of us remember the rutty, muddy, bumpy roads that formerly connected Toronto with Hamilton, and over which a motor ride was anything but a pleasure, especially to the owner of the car.

Let us consider the comparison of the former unimproved roads of the province, and the many still remaining to be improved, with our own industry of seven or eight years ago. The going was bumpy, rutty, and muddy. Let us then compare the present concrete highways with these unimproved roads. I do not think that anyone of us would choose to go over unimproved roads where pavements are available on which to drive.

To carry the comparison along a little farther, let us compare the joint efforts of our furniture manufacturers to the efforts of the men who had vision enough to build permanent improved roads. The road builders are not getting the most out of these roads, as they are there to be used by anyone, the builders included. They are there for the good of the community, and once having been establised, we would not do without them. The road we have built is the Association Road.

The Association Road

It is not necessary for every manufacturer to travel this road. He still can, if he chooses, use the old bumpy, rutty, muddy, side roads and probably reach his destination. The paved road of development of industry by association or by co-ordinated effort is, however, a much safer, smoother, cleaner method, and the destination is reached earlier. Travelling over a pavement leaves the mind freer of worry, and also avoids the tendency to constantly remain in the same rut in the road.

Continuing the comparison of association effort with improved roads, let us consider the various

services offered by our association as service stations along the road to success: First we have the service station of Assistance in Factory Problems. This station is equipped to assist our members in efficient operation of factories, to secure accurate records of production and costs, and to render any general service in the maintenance of an efficient organization. This service station is being enlarged so that it will also provide,—purchasing information, standardization of material used in the industry, tests and inspections of materials such as coal, lumber and other supplies.

When these are added, the service will be complete. Even now this service provides for the installation of cost systems, a guide through schedules as to average prices, and general information as to business conditions as issued in periodical bulletins.

Next we have the service station of Marketing. This is also being enlarged so that modern marketing methods will be used in distributing our merchandise. The first branch of this service. The Home Furnishing Bureau, is operating successfully, as witness the great interest taken by dealers, and the public generally. A special Merchandising Committee has been appointed, and information is being gathered to be placed before this committee for early consideration.

This committee should also consider the advisability of bringing our salesmen together for joint meetings such as we had yesterday for our superintendents. At these meetings addresses on salesmanship, design, etc., might well be given, from which everyone could learn of both methods in selling, and the fundamentals of the furniture business.

The service in existence for the longest period, and consequently a very efficient one, is the Credit Service. This serves as a check on overbuying on the part of certain dealers, and also as a check against unfair claims on manufacturers. It reports as to payments, renewals and other matters of interest to members on any furniture dealer in Canada. This indeed is a valuable service, and alone pays, I believe, in savings to members the entire cost of association services.

Future services planned include the adoption of a practical apprenticeship training course; one which will fit the need of changed educational and economic conditions, and which we heard discussed yesterday. A system of re-afforestation to provide in Canada at least a portion of the cabinet woods required, and a scheme of lectures of technical subjects by experts, some of which were discussed yesterday, and which among other subjects will include dry kilning, fabric construction, etc.

I do not feel that I am drawing an unwarranted parallel between association methods and improved roads; one is as necessary to progress as the other.

Rights of Others a Consideration

I further appeal, however, to our association members to recognize the rights of others on this association road. While as on modern roadways, certain rules have to be observed, so they must also govern our conduct towards other members on the same road. The road is wide enough for all, and recognition of each others' rights will help to make the journey more pleasant, and we will reach the end in a better frame of mind and in better condition.

Reports of the various standing committees which have had any work to do during the year will be submitted to you this afternoon, among them being the Labor Committee, Mr. Ferguson, Chairman, and Credit Men's Committee, Mr. Rowe, Chairman. A report on business conditions by Mr. Ferguson will also be presented. The Tariff Committee has had no occasion to meet during the year, nor has the Transportation Committee.

In regard to transportation, I am informed that no important changes will be made in Freight Classification No. 17 as compared with Classification No. 16 now in force. Proposed Classification No. 17 will probably come before the Board of Railway Commissioners some time this year, when our new Transportation Committee should carefully scrutinize the proceedings, so as to at least maintain the status quo in Classification.

A strong Tariff Committee should be appointed this year to deal with any tariff questions that may be raised following the change in Government.

Volume of Sales by Members

During the year the total business of our members fell from 19 millions to 12 millions. The figures for the various years in the immediate past are as follows:

Sale of Household Furniture in Canada by members of the association.

1915	6,162,133,00
1916	7,283,388.00
1917	8,835,589.00
1918	10,822,441.00
1919	16,566,546.00
1920	19,153,803.00
1921	12,000,000.00 (estimated)

Just at this point it would seem well to point out that in 1921 total sales dropped from 19 millions in 1920 to 12 millions in 1921, the reduction in prices of approximately one third during the year leaves the physical volume of shipments at about 90 per cent. of the physical volume of 1920. That the reductions in prices early in the year 1921, while not warranted by conditions prevailing at that time, were wise decisions nevertheless is proven by the total volume of sales. We assumed our loss early in the period of deflation, and the whole industry has benefited by the fact that the situation was handled well by our association.

Failures in these trying times, however, in proportion to volume of turnover are remarkably small. Averaging definite returns of failures made by many of the larger members, for 1921, we have estimated, and I think safely, failure losses to members of this association at 0.38 per cent. of sales. The failure losses registered in the period from 1921 to 1917, a six year period, were 0.85 per cent., so that during the past year we have, as a result of our Credit Service to members, reduced our losses through bad debts by over 50 per cent. This saving alone has paid for the entire cost of maintaining our association for the year, and besides paid a dividend on our investment in the association of 100 per cent. on the year's operation.

Our Imports and exports of furniture for the first eleven months of 1921, or to the end of November, which are the latest available figures, are as follows:—

	Imports	Exports
1921	1,174,728	298,336
For the same period of 1920 they stood at	609,217	773,886

The Home Furnishing Bureau Campaign in 1921 was carried on with an expenditure of $19,000.00.

with, I am sure, good results, although direct results are hard to check. An attempt to provide some check on results was the issue of the series of advertisments in portfolio form, which were sent to enquiries on payment of a normal charge of 10 cents each. Approximately 1,000 of these portfolios were mailed to those enquiring, which illustrates to some extent the interest of the public in Better Home Furnishing. Quite a number of appreciative letters from furniture merchants were also received.

During the Fall of 1921 your officials endeavored to call personally on all members. Unfortunately it was not possible to complete the program. Waterloo, Kitchener, Hespeler, Preston, Ayr, Hamilton and Eastern Ontario Centres were not visited, owing to lack of time. The visits made, however, were of considerable value.

I have endeavored to outline in condensed form the various activities of our association. Much work was done that cannot be touched upon in such a review. Needless to say, it has been a great pleasure to have been of some slight service to my fellow manufacturers, and I have very much appreciated the opportunity. To the best of my ability I have lived up to this position of honor and wish to record my thanks to every member for the kindness, consideration and assistance which they have rendered Mr. Ferguson, Mr. Cawkell and the other officials of the association as well as myself during the past year. In this way all have helped to maintain our association as the most progressive and best organized Trade Association in our Dominion, as it is recognized to be.

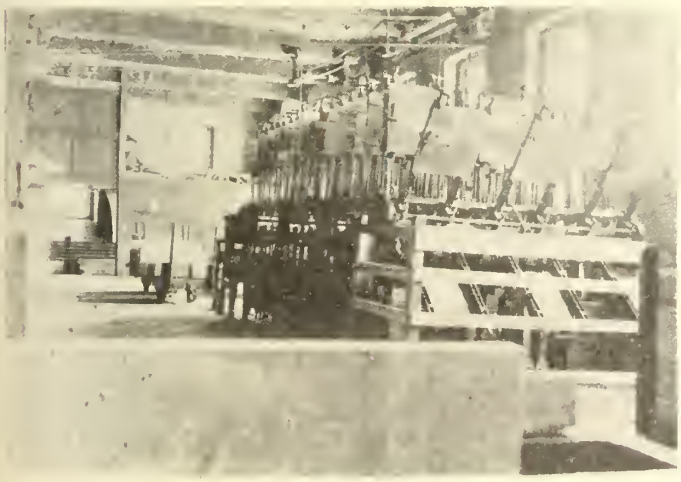
In conclusion may I bespeak for my successor, the various committees to be selected to govern this association in 1922, and the officiers, the same loyalty, and co-operation you have given the various committees, officials and myself during 1921.

The Development of Edge Gluing

How Clamp Carriers Cut Costs—Production Report Wood-Mosaic Co., Louisville, Ky. —Continuous-feed Glue Jointer Important Factor—Special Operations

by B. MATTHEW BURNS*

Probably the most primative method of clamping edge glued stock on a production scale that has persisted to the present day is the wedge method. It is true there are very few factories where one sees this method in use, and for his reason a brief description will be of interest. A heavy ten or twelve foot wooden beam of 6″ or 8″ squares cross section is secured



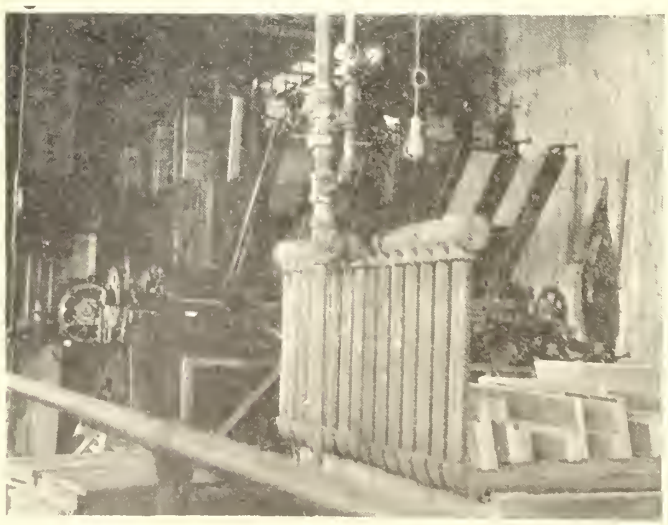
Clamp carrier in plant of North American Furniture Co., Limited, Owen Sound, Ont.

firmly at both ends just high enough above the floor to allow chair seats, say, to slide on edge easily underneath. The workman applies glue with a brush to the jointed edges of the pieces composing the seat and then, after fitting them together, slides the seat edgeways under the beam and drives a wooden wedge between the chair seat and beam.

This process was replaced with hand clamp on account of its obvious faults, namely, besides being a one-purpose process it was laborious work driving and removing the wedges, the workman wasting energy in alternately stooping over his work and travelling back and forth to the glue pot, and finally owing to the percentage of open joints resulting from pressure applied only at the centre of length of seat. The hand clamp while they permitted of wider varieties of production and fatigued the operator less, still retained many of the disadvantages possessed by the wedge method.

Development of Dovetail Joints

With these difficulties in mind an ingenious inventor produced a combination jointing and gluing machine which automatically machined a tapered dovetail in one piece of wood and a tapered tongue



Power driven clamp carrier in factory of Langslow, Limited, Cobourg, Ont.

in the other, applied the glue automatically and, by a sliding motion, forced the two pieces together, thus gradually building up the panel to about the width desired, when it passed through the sizing saw to be

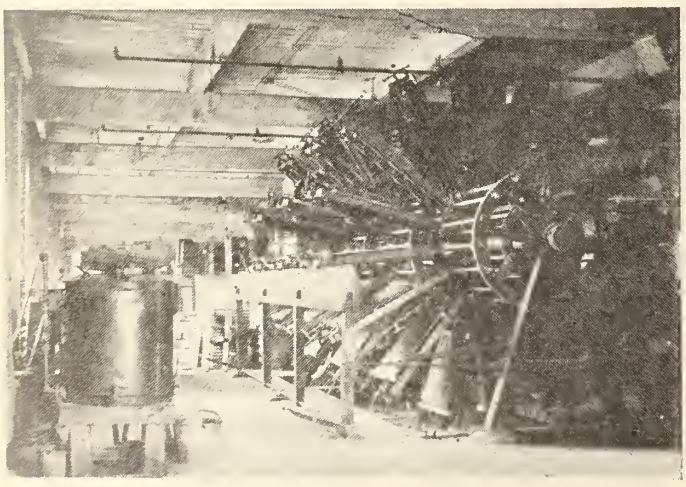
*Jas. L. Taylor Mfg. Co., Poughkeepsie, N.Y.

trimmed to the exact width. This machine was a big time saver over any that preceded it and although very expensive was rapidly installed in one factory after another.

Soon however, its disadvantages began to be apparent. The machine was very complicated, requiring one highly specialized operator, not easily replaceable, with two assistants to run it. If the glue was not of the proper consistency it was either pushed out of the joint when gluing hard wood or was absorbed into the soft wood leaving none in the joint in either case. In order to play safe 3/8" to ½" in width of lumber had to be sacrificed to the dovetail in each joint. Although this machine far surpassed any method yet produced for speed it produced a large percentage of open joints in spite of the effort to provide specialized operators to overcome the troubles which arose in connection with its operation. The machine being very complicated was very sensitive and was often down hours and many days at a time waiting for repairs, thus curtailing the production of the factory until the broken part was replaced. Although this machine is in use today in many factories and in some is giving satisfaction, the degree of success is due mainly to the skill of the operator and the character of the work. In general, however, manufacturers have realized that a big percentage of open joints result, and that apparent advantage of speed must be discounted by the time required to the work over again and keep the machine in repair; therefore, many manufacturers have already replaced this machine with a later improvement.

Clamp Carrier Placed on Market

At the time the combination jointer and gluer was at the height of its popularity inventive genious again conceived the idea that, as far as uniformly perfect joints were concerned, the hand clamps were superior to any existing machine, and therefore, set about to devise a new method that would speed up the process by eliminating the labor in connection with it, and finally brought out the clamp carrier. This machine is in principle an endless chain conveyor to which clamps are attached. It concentrated the manipulation of the clamps and work at one point so



Revolving type of clamp carrier

the workman was not required to travel back and forth across the floor. It raised the clamps to such a height as to enable the operator to insert and clamp up the work in a natural standing posture. It enabled him to make use of the small accessory glue roll by which he applied glue to all the jointed edges at once, and finally it enabled him to remove the work from the clamps after the glue had set at the same point where it had been inserted.

When provided with roller bearings this machine is easily hand operated as compared with the 25 or

Continuous feed edge jointer in North American Furniture Co's plant. Note warning on motor starting device

30 horse power required on the combination jointer and gluer mentioned above. For very heavy work on the very large machines an automatic power drive can be provided which at the outside does not require more than 2 h.p. motor. This machine is now manufactured to suit the requirements of the small as well as the large manufacturers, namely, 8 and 12 section wheel type 16, 20, 30, and 40 section chain type—4, 5 or 6 clamps per section for stock up to 42" wide and 6-½, 7-½ and 8-½ ft. long, the number of sections required depending on the character of the work, since only enough sections are required to allow glue to set before work is removed.

Cuts Costs and Raises Output

A brief consideration of the method of operation will indicate how the great speed possible with this machine is attained:—

1. Glue is applied to all jointed edges with one motion of the arms over the glue roll
2. Another motion of the arms slides the glued pieces one over the other onto the clamps.
3. The quick strong clamps then "weld the wood" —100% perfect joints.
4. And the succeeding set of clamps is brought down in front of the operator to receive new work.

The extreme speed possible is well shown by the records of Wood-Mosaic Co., of Louisville, Ky., who manufacture panels for the Victor Talking Machine Co. They have ten large Taylor clamp carriers in constant operation manufacturing chestnut, poplar, and oak glued-up stock, some of it made with a straight edge rip saw, some with a square and some with a "V" joint, according to the specifications of their customers. A week's production report from them dated last March, reproduced herewith, shows they are averaging between 20-½ to 24 revolutions per 40 section machine per nine-hour day and producing from a minimum of 1705 to a maximum of 3150 finished cores per machine and a minimum of 6528 to a maximum of 7827 surface feet of finished stock per machine per nine-hour day.

The same production can be obtained on solid work. In this connection it is interesting to note that a large

manufacturer of kitchen cabinets has gone a step further in cutting their gluing costs by taking their solid work directly from the chain feed rip saws to the clamp carrier, thereby eliminating the operation of jointing the work. It should be noticed that this is on solid work and produces very satisfactory results—results only possible because of the highly developed, strong individual clamps with which this machine is provided. Gradually manufacturers are coming to use the straight, flat joint in their work, having proved that it is reliable and is stronger than the wood itself.

A review of the clamp carrier would not be complete without a consideration of the "thick stock clamp" and "end clamping attachment," now found on certain machines. The former is applied to the carrier in the same manner as the regular clamp and is used for clamping built-up stock, having an extreme width capacity of 6-½". This clamp is provided with two draw bars to secure double the pressure and as tight a joint at the top as at the bottom. The end clamping attachment is used for applying pressure to the ends of the work at the same time pressure is applied to the sides and is widely used by piano factories in putting veneer on all four edges of their work at once and gluing moulding to the three edges of their key bottoms at once, by using caul boards to distribute the pressure and is being used for regular end clamping in other factories. This attachment does not interfere with the use of the machine for plain edge gluing.

Core Production Reports

Wood Mosaic Co., Louisville Ky.

Each unit comprises two 7½ ft. - 40 section Taylor Clamp carriers, each provided with 160-32" clamps. Two operators to each machine.

3/28/21	Unit No. 2—42 Revolntions			
Chestnut	1,700 Pcs.	28-¼ x 9-¼—	3,086′
	3,678 Pcs.	18-¾ x 20-½—	9,817′
	472 Pcs.	9 x 9 —	839′
	83 Pcs.	34-¼ x 20-¼—	400′
		Total	13,775′
3/29/21	Unit No.2—44 Revoultions		
Chestnut	647 Pcs.	28-¼ x 9-¼—	1,174′
	4,260 Pcs.	18-¾ x 20-¼—	11,370′
	1,232 Pcs.	9 x 9 —	693′
	32 Pcs.	34-¼ x 20-¼—	154′
	228 Pcs.	18-¾ x 20-½—	608′
		Total	13,472′
3/30/21	Unit No. 2—41 Revoultions		
Chestnut	3,551 Pcs.	18-¾ x 20-½—	9,478′
	1,014 Pcs.	28-¼ x 19-¼—	1,840′
	96 Pcs.	34-¼ x 20-¼—	462′
	1,105 Pcs.	9 x 9 —	622′
	405 Pcs.	18-¾ x 20-¼—	1,081′
		Total	13,483′
3/31/21	Uuit No. 2—48 Revolutions		
Chestnut	609 Pcs.	18-¾ x 20-½—	1,625′
	5,386 Pcs.	28-¼ x 9-¼—	9,961′
	1,303 Pcs.	9 x 9 —	734′
	102 Pcs.	28-¼ x 9-¼—	185′
	92 Pcs.	34-¼ x 20-¼—	443′
	55 Pcs.	14-¾ x 16-½—	93′
		Total	13,059′
4/1/21	Unit No. 2—41 Revolutions		
Chestnut	742 Pcs.	18-¾ x 20-½—	1,980′
	2,287 Pcs.	34-¼ x 20-¼—	11,016′
	136 Pcs.	9 x 9 —	77′
	244 Pcs.	28-¼ x 9-¼—	443′
		Total	13,516′
4/4/21	Unit No. 2—47 Revolutions		
Poplar	615 Pcs.	13-½ x 15-¾—	908′
	91 Pcs.	23-¼ x 9 —	132′
Chestnut	297 Pcs.	34-¼ x 20-¼—	1,430′
	2,500 Pcs.	34-¼ x 20-½—	12,042′
	1,584 Pcs.	9 x 9 —	892′
Oak	250 Pcs.	16-½ x 17-½—	501′
		Total	15,654′

Makes Ideal Combination

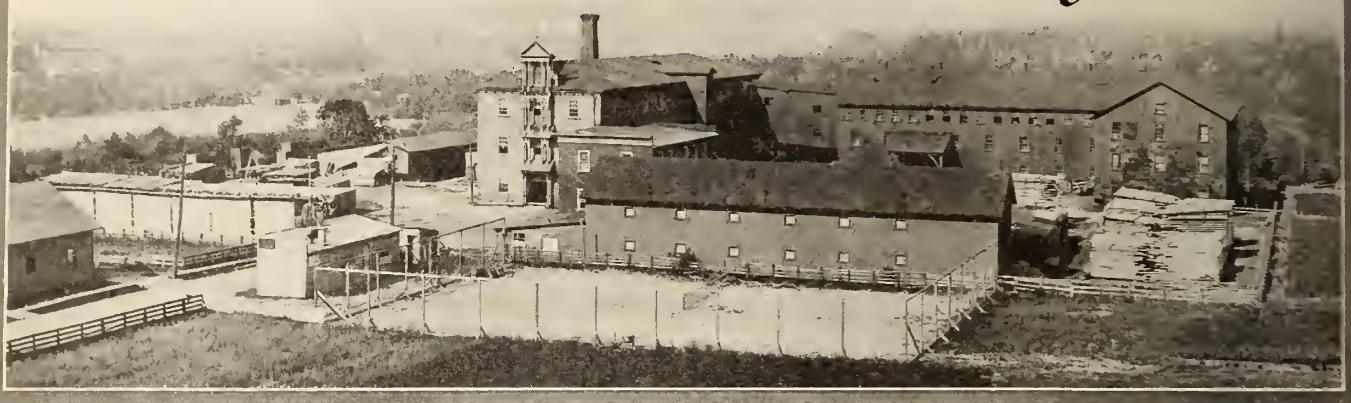
The clamp carriers represent the highest point of development of the art of edge gluing today, is faster then any other method, produces 100% perfect joints, requires a very small comparative investment and the upkeep expense is practically negligible. In the modern plant the clamp carrier is employed largely in connection with the continuous feed edge jointer or as it is sometimes called the automatic glue jointer. This machine is too well known to require a detailed description. The pieces to be jointed are carried over the cutter heads by a combination chain and roller feed works. The stock is held rigidly between rolls and chain and as the movement is a straight line the jointer is capable of doing extremely accurate work. By using special cutter heads practically all types of joints, such as square, "V", tongue and groove, etc., can be made. In some machines an adjustment is provided to make either straight or hollow joints. The pieces are fed through one side, turned over and fed back on the other side so that in reality two streams of material are going through continuously, tending for high production.

Some manufacturers have put this machine to special uses, such as squaring up dresser posts and the other thick material, running rabbits on door stiles for case goods, end matching certain stock and for running simple forms of edge mouldings. When put to special operations like this, suitable heads must be provided. It is often found that cost may be reduced considerably by putting various machines to new and original uses.

Sanding Wood Turnings

The sanding of wood turnings by mechanical means has developed to such an extent that it is possible with the modern type of special sander to clean up turnings of various kinds without losing any of the details. What this means to the manufacturer of turnings or to the manufacturer of furniture into which turnings enter largely, is hard to realize. One manufacturer of a general line of furniture found that one of these special machines for sanding turnings replaced six operators, who did nothing but sand turnings, and has resulted in a saving estimated at $12.00 a day. Another manufacturer, this time of four-post beds, stated recently that since he installed a special turning sander a little over a year ago, he considers it has paid for itself three times over in the saving on the cost of the sanding operation. Another saving made through the use of such special equipment is that by sanding down to the solid wood, removing all roughness and fuzz, the stock does not absorb nearly the same amount of varnish or finishing material,

A Picturesque Furniture Factory *with a Power Plant at its Back Door.*



On the Great St. Lawrence Waterway at Riviere du Loup the St. Lawrence Furniture Company Lives, Moves and Has Its Being. Remote from the Larger Industrial Centres, the Conditions under which it Operates are of more than Usual Interest. In this Article the Reader is Given a Brief Pen Picture of the Plant and Is Told Something of the Peculiar Advantages Which it Enjoys.

Ever been to Riviere du Loup?

If you know anything of the greatest waterway in the world, our wonderful St. Lawrence,—particularly if you have ever sailed out of Montreal or Quebec on the far-famed Saguenay River trip, you will know just where Riviere du Loup is, when we tell you that it is nearly opposite Tadoussac, on the south bank of the St. Lawrence River,—which is twenty-two miles wide at that spot.

Apart from the fact that the town possesses a woodworking factory which contains features of interest all its own, Riviere du Loup is no name to juggle with.

In the first place it has a population of 7,500,—and is therefore, a city, not a town at all!

Riviere du Loup is within hailing distance of Rimouski, the first point of contact one makes with home after a summer sojourn in the Old World.

Riviere du Loup is well-connected. It is one hundred and fifteen miles from Quebec, the Sentinel City of the St. Lawrence, and two hundred and sixty-eight miles from Montreal, the commercial metropolis of the Dominion.

But we are led back to our original reflection that Riviere du Loup is on the south bank of the St. Lawrence River,—opposite Tadoussac.

Tadoussac! That jewel of the St. Lawrence "where the flying fishes play," and where industrial excitement is forgotten in the wonders of Nature and the exhilarating environment of the place where river and ocean meet.

Don't miss Riviere du Loup if you haven't been there. Take a trip down the St. Lawrence on your next summer holiday. It will repay you.

A week or so ago, a representative of the "Canadian Woodworker" braved the winter storms, crossed over from Quebec City to Levis, and ran up to Riviere du Loup to look over the plant of the St. Lawrence Furniture Company. He had been told that it was worth while, and it was,—even in winter!

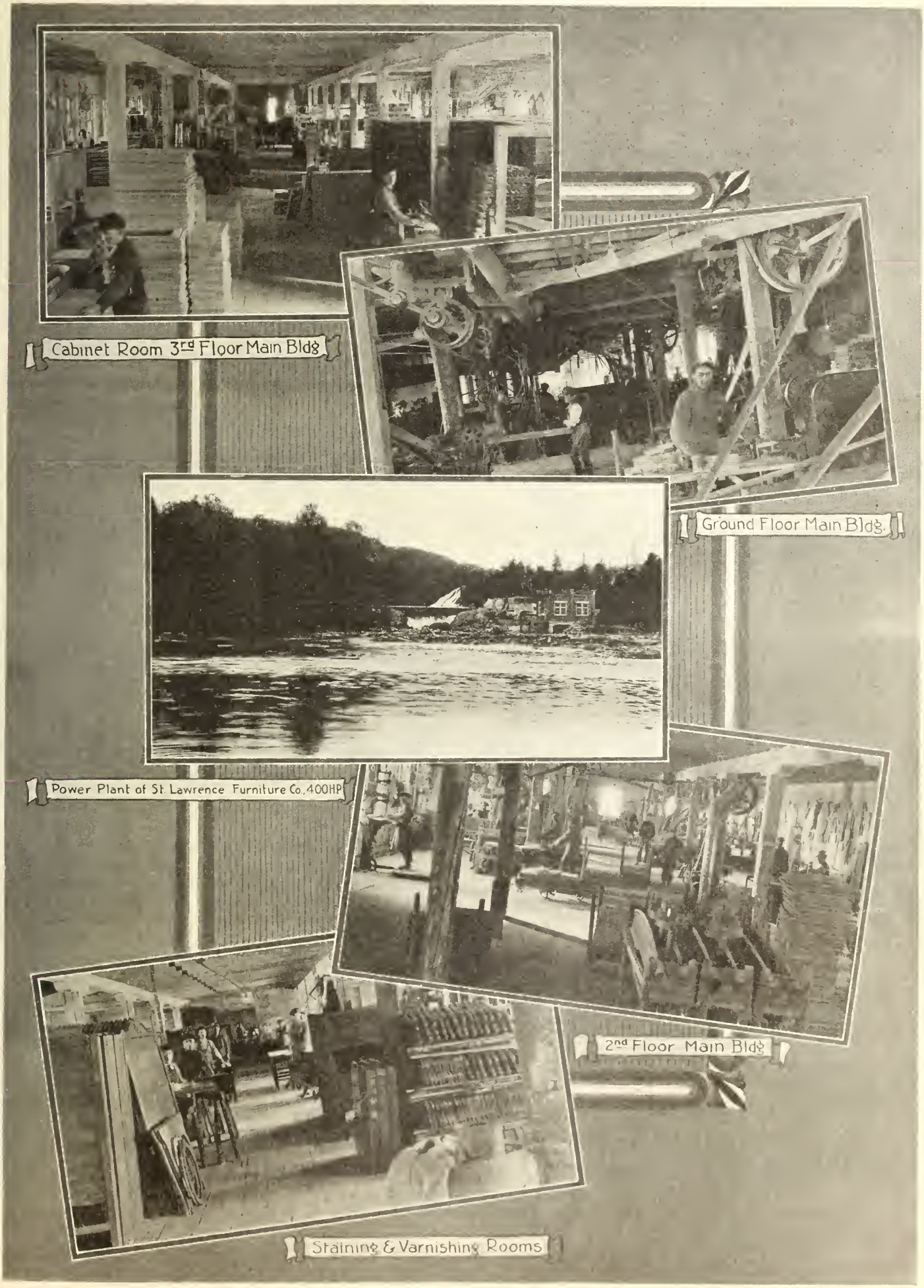
A Picturesque Location—With a Power Plant at the Back Door

An idea of the picturesque location of this plant may be obtained from the general view published herewith, and from the photograph of the company's power plant which is situated at their back door, only a thousand feet from the factory.

The development by this company of their own power is conspicuous among a number of advantages they enjoy. How many woodworking plants in Canada develop their own electric power? Here is a nice little problem for the readers of The Woodworker. We venture the opinion that the fingers of one hand only will be necessary in arriving at the solution. The power-house shown in our illustration is situated on the Riviere du Loup. The company develop over 400 h.p., of which they use 150 h.p. for the operation of their plant. Surplus power is thus available for two other factories—engaged, say in the manufacture of chairs and high-grade furniture.

Apart from the company's power development, the municipality have a plant at which they develop 2,500 h.p., electric energy being available at very low rates.

The St.Lawrence Furniture Company are engaged in the manufacture of cheap and medium grade household furniture. Their market is an extensive one—the territory stretching from Newfoundland to Vancouver. They specialize in bedroom and dining-room


Cabinet Room 3rd Floor Main Bldg
Ground Floor Main Bldg.
Power Plant of St. Lawrence Furniture Co., 400HP
2nd Floor Main Bldg
Staining & Varnishing Rooms

suits, manufactured out of native hardwoods secured within a radius of one hundred miles of the plant. They have their own saw-mill, in which they cut some 500,000 feet of lumber each year—approximately one-third of the material used by the plant.

Factory Plan Facilitates Routing of Material and Provides Breathing-Space at the Same Time

From the general plan of the factory it will be seen that the plant enjoys many advantages. First and foremost is the manner in which the plant itself is laid out. While the various departments are not sufficiently removed from one another to interfere either with the routing of the material through the various stages of operation, or with efficient supervision on the part of the management, they are so placed that there is ample breathing-space and light in every corner of the industry.

The advantage of locating a factory where plenty of land is available at a reasonable figure needs no elaboration. Only too often the problem of space in city districts make it necessary to sacrifice health and efficient working conditions to considerations of production and productivity—within the narrow con-

A product of the St. Lawrence Furniture Co.

fines of a limited area which stunt both growth and enterprise. In such factories as the one at Riviere du Loup, healthy conditions and effiiciency go hand-in-hand with maximum production—and there is always room to grow.

Little explanation is required of the general plan to which we have referred. In the centre there is the main building,—of brick construction; on the left the Kiln Sechoir—dry kiln; on the right the stabling and warehouse for dry lumber; and in the middle background there are the varnishing and shipping departments. Piles of lumber uniformly arranged at sufficient intervals to admit ample ventilation and drying space are grouped around the buildings. The lumber is seasoned in the piles for a period of twelve months and at the end of that time goes to the kiln, which is a modern moist air dry kiln (capacity 40,000 feet of lumber) by Sturtevant.

The total floor space of the plant is approximately 70,000 spuare feet, of which area 25,000 sq.ft. are contained in the floor space of the main factory, where all the machinery is located.

The main building is solid brick, three storeys high. Light, airy offices and show-rooms are situated on the main floor annex, while there are sample-rooms on two floors.

The breaking out of the lumber is done on the ground floor, which is well equipped with the latest improved makes of machinery. The superintendent's office and drafting room are also on the main floor. Here, too, there is a machine shop where repairs of every description are made.

A dust and shavings exhaust fan, situated on the main floor, takes all the sawdust and shavings to the boiler and thus contributes an important element of efficiency in clearing the atmosphere and in preserving the life of the machinery.

The accompanying photograph of the second and third floors and working efficiency, location of the machinery and stock reveal careful planning. There is no congestion, no delay: from the raw material to the finished product is an uninterrupted and direct sequence of operations.

From the second floor, after the inspection of the veneer presses and the operation of that department, we pass to the third floor, which is the cabinet-assembling floor. Here there is a complete equipment of buzz planers, disc and drum sanders, veneer presses, and so on. This is where the graining is done.

From the third floor the goods are taken to the staining room and then on to the varnishing room, both of which are 100 feet by 40 feet in dimensions. A Mattison electric polishing machine is conspicuous in the varnishing room.

The plant is fortunate in the possession of ample shipping facilities both by land and water. It has two rivers—the St. Lawrence and Du Loup—and two railroads, the Temiscouta and the Canadian National. The company have two motor trucks for the loading and unloading of their cars.

An efficient fire alarm system is situated in this building, direct connection being made with the city system. The municipality provides a water pressure of 125 pounds to the square inch. Stand pipes and hose are provided on each floor. The company enjoy a clean record in respect to fires—either great or small.

Under normal conditions the St. Lawrence Furniture Company employ a staff of one hundred hands. During the war they operated to capacity day and night for three years making shell-boxes on Government contracts.

Mr. Mailloux, the Manager, is optimistic concerning the future and anticipates a greatly increased output upon the resumption of constructional development—particularly house-building, which he regards as no longer possible of much further delay.

Twenty-One This Year: A Man-Sized Plant

Mention of this firm is particularly appropriate at this time in view of the fact that it is just attaining its majority. The St. Lawrence Furniture Company was founded in 1901 by Mr. Octave Laurin, who became its President and Manager and died three years ago. Mr. Laurin was succeeded as Managing Director by Mr. J. H. Mailloux, who has had upwards of a quarter of a century in the furniture-making business and has been with the company since its formation.

The Superintendent of the plant, Mr. H. Desrosiers, is an old and experienced hand in the woodworking business. He has been with the firm twenty years, and he can tell you of the early days of furniture manufacturing ten years before that. A connection

Officials of the St. Lawrence Furniture Co., Limited, Riviere du Loup, P.Q.

of no mean standing is that of Mr. J. L. Beaulieu, the Secretary, who has been with the company seventeen years. J. L. started in as an office junior and is considered to know something about book-keeping and finance.

The present directorate consists of Mr. Jos. Viel (President),—who by the way is Mayor of Riviere du Loup; Mr. J. H. Mailloux, Managing Director; Mr. J. L. Beaulieu, Director and Secretary-Treasurer; Mr. Nelson Carson, Vice-President; and Mr. H. P. Monsarrat, Director.

Our friend, Mailloux, will tell you that they know nothing of labor troubles at Riviere du Loup. Plenty of help is available, comfortable homes are obtainable at low rentals, and the "city" is sufficiently removed from the whirl of the large industrial centres to escape their temptations. It's early to bed and early to rise at Riviere du Loup! The workers there have their own community life and are happy in it.

Thus the plant whose history and operations are reviewed briefly in these columns is noteworthy by virtue of advantages seldom enjoyed in their entirety by larger competitors. It is a pleasant picture—a well-lighted, well-equipped factory operated by an efficient and contented staff—a factory situated in the heart of a picturesque district which yields raw material in abundance and supplies the power to turn that raw material into the finished product of household furniture.

The St. Lawrence Furniture Company's plant is a conspicuous example of French-Canadian business enterprise at its best.

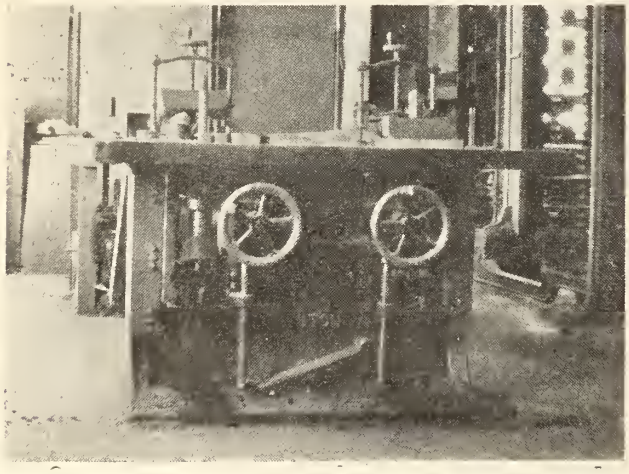
Doubling Up On Shaper Operations

Increase in Spindle Speed Has Worked Transformation—Works Well Either With or Against the Grain—Smoothness of Cut Reduces Sanding—Comparison With Slower Speed Machines

By C. H. PRATT

During recent years the humble shaper has come into greater prominence as an efficiency, production machine, the development being toward heavier machines with high speed, rigid, non-vibrating spindles. As the advantages of high spindle speeds were demonstrated and higher speeds were demanded, it was found that the older types of bearings would not stand up under the added strain. As a consequence a resort was made to ball bearings which had proved their ability to stand up under unusually high speeds. The result is that to-day there are many makes of ball bearing shapers on the market, ranging in speed from 7,000 r.p.m., to 12,000 r.p.m. and even in some cases to 15,000 revolutions per minute.

Naturally the first question asked by the practical man is,—Why such excessive speeds and what are



Double spindle, ball-bearing shaper in Malcolm & Hill plant, Kitchener

the advantages accruing? It has been found that a high speed shaper will cut considerably faster than a slower-running machine, in some cases more than twice as fast and that the cut is smoother, requiring considerably less sanding. All this means increased production from both the shaping and subsequent sanding operations. In fact, the efficiency of the rapidly-revolving shaper spindle is so high that it has been found practical to build a single spindle machine for ordinary forms of variety work. This cuts with equal facility either with or against the grain. This must not be taken to mean that the cut made against the grain will be as smooth and perfect as the one run with the wood, but the edge finished against the grain will be found to be smooth enough to require very little sanding. In demonstrating this point a triangular piece of wood is shaped on the three edges without losing the corners.

How Time is Saved

Another advantage of high cutter speeds is that a heavier cut may be removed. This means that when shaping to forms it is not so necessary to band-saw to the approximate size as is the case with the slower-speed machine. In many instances the band-sawing operation may be omitted entirely, the work being performed on the shaper right from the rough planks. This saving, taken in conjunction with the increase in output, demonstrates just how efficient the ball bearing shaper is.

A manufacturer operating three different makes of shapers,—a plain babbitt-bearing shaper with a maximum speed of 5000 r.p.m., a bronze-bearing shaper running at 6000 r.p.m., and a ball-bearing shaper with a speed of 7500 r.p.m., decided to make a test on three machines to see how one compared with the others. One man used all three machines on exactly the same kind of work for a stated length of time. As he moved from the slow speed to the high-speed machine, the quantity as well as the quality of his work showed a marked improvement. Under this test the ball bearing shaper turned out twice as much work as the babbitt-bearing machine, and the product had a much better finish. Another instance is where a manufacturer found that on a certain class of work it was necessary to remove from ½ to 1 inch of stock. With the old machine it was often necessary to cut this material away on the band saw, and even when this was done, the work was rough and required considerable sanding. With the ball bearing machine it was found that this work could be run through without any band sawing and the resultant cut was so smooth as not to require any sanding.

Sanding Operation Lightened

The cost of sanding is no small item in connection with shaper work. Often it is very much more than the cost of the shaping itself. With the high speed shaper this sanding is to a great extent eliminated, which in itself is a very important feature. In some plants it is estimated that 75 per cent is saved on the sanding operation alone.

While power consumption may not be of very great importance, yet a saving is made here as well. In plain bearings it is estimated that from 60 to 70 per cent of the power delivered by the belt is lost in overcoming bearing friction. Ball bearings reduce this loss by about 65 per cent, which means a saving of from 40 to 45 per cent in power used. This means that where 5 h.p. is required to run a double spindle shaper, fitted with plain bearings, 3 h.p. would be all that is needed for the same machine when equipped with ball bearings.

In view of the above facts, it would appear as if with the ball bearing shaper, production is increased, the quality of the work improved, less sanding is required, the power consumption is lower and finally but not the least important, bearing troubles are reduced.

Elm-Wood Works, Winnipeg, Man., was recently organized to conduct a general woodworking business. The two partners are W. C. Tidball and A. Doloway, both of Winnipeg.

Basic Time Standards---Their Relation to Production, Cost Accounting and Estimating

Eliminate Guessing from Many Phases of Woodworking Management and Place Industry in Position to Carry-on with Greater Degree of Assurance

By Wm. SNAITH, C. E., Associate Engineer, Forest Products Engineering Co., Chicago

Nothing can be measured accurately without a measure or standard. We measure lumber by the board feet, iron by the pound or ton, water by the pint or gallon. We understand very clearly how much lumber we expect to get when we specify so many thousand board feet, and we can determine more or less readily how many board feet will be required to build a buffet, table, door or sash. Knowing the cost of our lumber we readily arrive at our material cost. No one would consider it an accurate estimate of the material in a dresser if the estimator figured that because there was so much lumber in a dresser made last year a new design would probably require so much more. Such an estimate would only be a guess and should be labelled as such. Most of the estimates in some such hit-or-miss fashion and amount to nothing better than a guess. It is only fair to say that many of these guesses come very close to the actual cost.

Even when these guesses are backed up by the records of past performances supplied by an accurate cost system they still lack the positive quality of the estimate of material. Furthermore it would make little difference what kind of a factory the work was to be done in the amount of material would not vary to any great extent. This would very emphatically not be the case in the matter of labor. The nature of the equipment and the methods of doing the work would affect the cost to a very marked degree. It is quite possible, knowing certain readily ascertainable facts about the available machinery for doing the work to determine how many hours of labor will be required for the various machine processes, for assembling and finishing. Such an estimate involves a certain amount of work to prepare but it has the merit of being extremely accurate.

Value of Knowing Costs in Advance

Accurate estimates of future costs are destined to be increasingly valuable. Many lines which have to be sold at a loss would never have been manufactured had the maker known what the final cost was going to be. In an era of generally falling prices it will be a much more serious matter than formerly to absorb such losses. It will pay to spend a little more on clerical work if thereby unprofitable lines can be prevented.

Estimates are useless and misleading unless the cost of the work is kept within them. Cost records are almost equally valueless if there is no certainty that costs will not be increased the next time the article is made. It is not enough to know that the cost should not exceed a certain figure if steps are not taken to positively prevent such a thing happening. In a plant with a very excellent cost system which accurately records actual costs with a surprisingly small factor of error it is more or less common for costs to fluctuate from 20% to 50% and even higher in some of the departments. These fluctuations occur in spite of the fact that they are always the subject of investigation. Naturally this prompts the query as to what variations occur where the cost system is only partially complete and accurate, and further when there is no real cost system. It becomes easy to understand the discrepancies disclosed in recent numbers of the "Canadian Woodworker" in estimates of sash and door costs.

Of course there are plants where it is a point of honor to keep the office staff down to a minimum—in every sense of the word. In the conditions existing in a period of expansion such plants may not only exist but even have a modified share of the general prosperity thrust upon them. In times of deflation and reconstruction these are the first concerns to go to the wall. They are followed by those whose methods are slipshod and who deceive themselves by inaccurate methods of accounting and cost accounting so that inefficiencies of manufacturing and merchandising are not brought to light. Among these concerns are those which have tried to carry on with the same overhead as in good times and without adequate retrenchment in other expenses. Over-staffed and not securing either quantity or quality of work in proportion to the wages expended the balance sheets of such firms tell a story which is not likely to have a happy ending.

Do Woodworkers Lack Business Acuteness?

There are not as many woodworking firms as there should be up among the leaders in modern business methods. Genius, they say, is an infinite capacity for taking pains and the clerical work involved in modern methods means the taking of no little pains with a variety of details. The success of the leaders is built largely on the genius and courage which digs deeply into fundamentals and despises not the day of small things. Minutes saved in minor operations and waste motions eliminated loom large in a balance sheet after being multiplied many fold in a twelvemonth. Too much emphasis can not be laid on these facts because of the disposition of those unfamiliar with the type of records called for in scientific management to regard them as excessive "red-tape". As a matter of fact the actual time taken from productive work is really less with properly designed production time tickets than is generally the case when the workman reports his own time on a single slip of paper towards the close of the day, distributing his time over the various jobs worked to the best of his recollection and in any case so as to forestall criticism as far as possible.

If production costs can be cut down the profits of good times can be equalled if not exceeded in the present lean years. Here we enter the province of

the industrial engineer and any study of modern methods would be incomplete without a consideration of the contribution to cheapening and increasing production by the engineer. Woodworking is one of the last great branches of industry to attract the services of the engineer, and the extent to which it will benefit is only beginning to become apparent. The engineer, by training and experience is led to delve deeply into fundamentals, to take nothing for granted. In the words of scripture he "Proves all things, holds fast that which is good." The human element is not neglected in the analysis of the problem and the result is a solution which is not coldly mathematical and theoretical, but intensely practical.

Wage Payment on Definite Basis

The foundation of scientific control of production involves several distinct steps. After an analysis of the product and the available means of producing it, the materials and methods as well as the product are standardized to the fullest possible extent. The problems of each individual plant are different and no system could be devised which could be transplanted bodily from one factory to another. Principles do not alter, but there is infinite variety in their application. The principle of reward in proportion to effort is cardinal in securing maximum production. In practice this involves the use of piece work or a bonus system, preferably the latter. The Earned Hours, or Earned Time Plan of the Forest Products Engineering Company, recently described in the Canadian Woodworker, retains all the advantages of the day-work system without the disadvantages which make that system unfair and unworkable. At the same time it is essentially different from straight-piece-work with its obvious disadvantages.

In this plan the worker is given an hourly rate and guaranteed his nine or ten hours per day. The work is estimated to take a certain time per hundred pieces and the worker is credited with all the time earned and is paid for the "earned hours" when they exceed the clock hours. The determination of the rates or standard times for the various operations is the result of careful time-study observations and comparison with other data. The whole system rests on the foundation of these time standards. On this foundation a great deal of building can be done. Their application to estimating was hinted at in the opening paragraphs and when so used the accuracy of an estimate of the labor on an article as complicated as a buffet or dresser will equal the accuracy of the estimate of material in it. Further, such an estimate will not amount only to a general idea of what the article ought to be manufactured for, it will represent exactly what that manufacturer will pay his own men in his particular plant for doing that certain piece of work. This ties estimating and cost accounting together in a perfectly satisfactory way.

Studying Possibilities of New Equipment

In considering the purchase of new equipment the manufacturer again falls back on basic time standards. He knows the speeds and feeds of his present machines and he can compare rates based on these with others based on the specifications of the machine he proposes to buy. As long as he has even an approximate idea of the number of hours work he will have for the machine in the course of a year he can determine whether the investment will show a profit or not. It is a common experience to find the machine salesman's promise of a 50% or 100% increase in production not at all substantiated after the new machine is installed. That the machine is better than the one it replaced may be admitted, but the fact will remain that the increase in production is discouragingly small, nothing approaching the 50% promised. The explanation will lie in the nature of the work done. Perhaps a few figures will serve to make this clear. Consider a machine such as a shaper in which the operation consists of the two elements, handling and cutting. Let us concede that the new machine will cut twice as fast as the old one. Assume that the handling time is the same in three cases, but that the cutting time is .08, .32 and 1.40 minutes for the old machine and half these figures in the new.

Old Machine		New Machine	
Handling time	.16	Handling time	.16
Cutting time	.08	Cutting time	.04
	.24		.20
		Saving 16.7%	
Handling time	.16	Handling time	.16
Cutting time	.32	Cutting time	.16
	.48		.32
		Saving 33.3%	
Handling time	.16	Handling time	.16
Cutting time	1.40	Cutting time	.70
	1.56		.86
		Saving 45%	

Since the time for setting-up and trucking, etc. would be constant and the same in both cases the actual saving would in fact be less than the figures given above. The point the buyer would have to consider would be how much of his work would consist of small pieces with short cutting times. Here the saving is small and unless the machine were constantly in use there might be no return on the investment. While the possible saving with long cuts would fall short even of the promised 50% increase it would still represent a decidedly profitable investment.

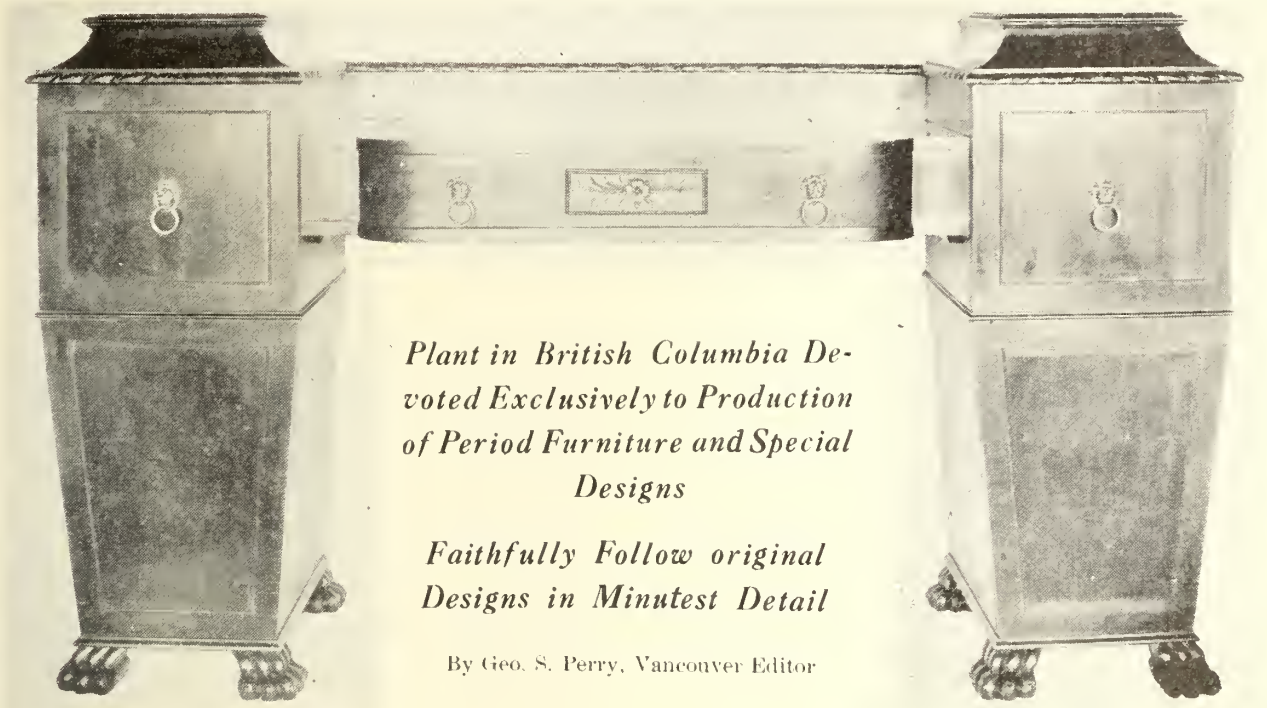
Accurate Knowledge Basis of Changes

In arriving at the most economical routing of work there is frequently room for doubt as to the machines to use. Here again a few calculations with basic time standards will give the solution. Lay out both routes and calculate the times for each set of operations and the one which shows the least time will be the most economical. When changes in design or routing are to be considered the exact effect they will have on the cost of the article may be readily figured and whether the change will be profitable may be known before it is authorized.

Time standards are but one of the instruments or tools devised by the engineer for the manufacturer to use and as outlined in the foregoing paragraphs many uses already are made of them besides the original purpose for which they were designed. They are of the nature of foundation work which is ever unspectacular and always involves digging and all that is implied in the word. The foundation they afford is exceedingly safe and solid. It is worthy of the kind of structure which leaders have built in all times.

The fret saw is only a small machine, but if it is not fastened securely it will set up a considerable vibration much beyond its size.

Modern Factory For Hand Made Furniture



Plant in British Columbia Devoted Exclusively to Production of Period Furniture and Special Designs

Faithfully Follow original Designs in Minutest Detail

By Geo. S. Perry, Vancouver Editor

"Modern" usually strikes a sharp note of contrast with times and methods that are past. But if the word means something of the present time, then one Vancouver furniture shop can claim the paradox of being "modern" while working on methods associated with the early days of the industry. Entirely hand made is every piece turned out from the factory of the D. C. Timewell Co., Ltd., Vancouver, B. C., where thirty skilled men, most of them trained in old country shops in their various branches of the cabinet maker's trade, are constantly busy on choice specimens, reproducing faithfully some of the very best designs of every period.

The Pride of Workmanship

The contrast with modern furniture factories, where labor-saving machinery enables quantity production at low cost, is made sharper by the fact that the Timewell factory has scarcely any machines. Four or five, such as small bandsaw, planer, spindle machine, turning lathe and rip-saw, covers the entire plant operated by power. These are used to facilitate the various hand processes, carried on by the skilled craftsmen. A jig-saw for fret-work may be added, but beyond that the company does not plan to extend their use of machinery.

"There is incentive to a man, when he is handed a working drawing of a piece of furniture and he sees the finished product of his handicraft result from his effort and skill," said Geo. Laidler, member of the firm and superintendent of the factory, discussing and describing the methods of work in the business. "Practically every order is special and individual. In most cases no repeat orders are likely. In fact we have a trade which demands exclusive work.

"It is interesting to follow the inception of an order from the first idea of the customer or suggestion from ourselves. Often a rough sketch, giving the general form of the piece or a set of furniture is all we have to work on. Occasionally a photograph or a published design is brought to us, and quite frequently a single piece of old furniture is sent in by the customer. At other times, we are asked to submit a finished sketch for approval. In every case," said Mr. Laidler, "before working plans are given out to the cabinet-maker or wood-carver, we make a sketch showing the appearance of the piece desired. The correct detail for every period or design is adhered to strictly."

"How about material used?" we asked.

"None but the best grades of the special cabinet woods required for each piece are used," said Mr. Laidler. "We make every piece 'solid', so that there are no veneered or faced frames. In the interior work of dressers, sideboards and tables we use yellow pine, tops and fronts as well as the frame are solid wood, whether Honduras mahogany, black walnut, oak or other wood is used."

Jacobean Always in Plain Oak

In the factory when visited, work was proceeding on a complete dining suite of Jacobean design, in heavy oak. One detail pointed out, to show the care in following correct canons, was that no quarter-cut oak was used. "It was not known when the design was first made," was the comment. Two men were busy on the heavy

sideboard, another was at work on one of the two arm chairs, others were making the dining table frame, and in the upholstery department swift needles were fashioning the padded back of the other arm chair. It was interesting to find that one of the employees of the factory was the designer and owner of a special machine, combining a lathe and a spindle machine in one, for turning out at one operation the distinctive twisted legs for chairs, table and sideboard of this Jacobean suite. The man had only completed his machine two months ago. Prior to that the Timewell factory had had the work on all such pieces done by hand, execpt once when they had obtained a set of spindles from an Eastern Canadian factory. The employee is encouraged by being given piece work orders for all these Jacobean legs and he keeps his invention at home in his basement where he does his work.

A silver cabinet, carried out to suit a customer who had handed in a very rough sketch with a few verbal instructions, was an item being made at one bench. In another corner the arms of a Sheraton settee were being shaped. Up in the varnishing room, the finishing touches were being given to a pair of twin beds in dark stained mahogany to match a wide bed sent in by the customer. Cane panels were being put in the head and foot boards, and an exact reproduction was being achieved. One of the lines on which the Timewell factory finds itself often called to work is where a family has divided up an old set of furniture, heirlooms prized perhaps for generations. One or more members may wish duplicates of the original pieces and here a faithful copy is called for. Many rare pieces of old furniture have come direct from the old country to British Columbia and these are frequently sent in to be copied and in some instances to be restored.

Another interesting feature of the demands made upon this unique factory is when a big furniture store in Vancouver or Victoria asks to have an additional piece made to add to some expensive set they have in stock, and which it would cost more to have specially shipped from the original factory. Sometimes too, prospective buyers ask to have an additional piece of uniform design added to a set on display in a show room of a down town furniture store. Many such orders gravitate to the Timewell factory.

Has Enjoyed Steady Growth

Starting in a modest way ten years ago in Vancouver, D. C. Timewell, founder of the company, from the first paid special attention to hand work. An upholsterer trained in the Waring & Gillow shops in Liverpool, England, he knows every part of the business. Geo. Laidler, his associate from the first, has a training as cabinet maker received in big shops at Newcastle on Tyne. Up to two years ago the company continued its business in premises attached to its down-town show-rooms. For the past two years all manufacturing has been carried on at the factory on Dufferin Street, where the company owns the building, and also has additional ground space to erect an extension. Steady increase has marked their progress, and the building up of a staff of thirty hands has been no small task, as each man is trained for some special line of work. Almost all were trained in old country shops where more hand than machine work was the rule. To prepare for further increases in staff and to provide against shortage of trained help, the company has a policy of training up its own men, and a number of lads who have been learning their trades in the factory for some time, are already advancing to the position of skilled workmen. In this way a sufficient supply of the right kind of help is being insured, while incidentally teaching some young Canadians skilled trades they are always sure of employment in at good rates of pay. "We pay a little over the union scale and stick to the eight hour day, and we find that we get the very best of results and co-operation from our men," commented one of the principals.

Do Your Own Thinking

For fifteen years, old Tom Smith had been running the pumping engine at Brown's Falls. For fifteen years old Tom climbed up twelve feet on a ladder every day to squirt oil in a little hole in a valve-motion rockshaft.

One day he slipped and nearly fell. The Superintendent saw it and investigated.

"What were you doing up there?" the Superintendent asked.

"Shot a little oil into that hole up there."

"What hole?" returned the Superintendent.

Tom showed him.

"Why man!" exclaimed the Superintendent, "that's no hole; that's only a lathe center—what they turned the shaft on when they made it!"

So it was. We all know how old Tom felt when he found out that the hole he had faithfully oiled so long was only a blind alley. That's the difference between men—some use their brains and some don't.

That's the difference between the Tom Smith and the Tom Edison type of man. The fellow that does his own thinking gets paid for it.

Did it ever occur to you that the man who needs much supervision pays for it?

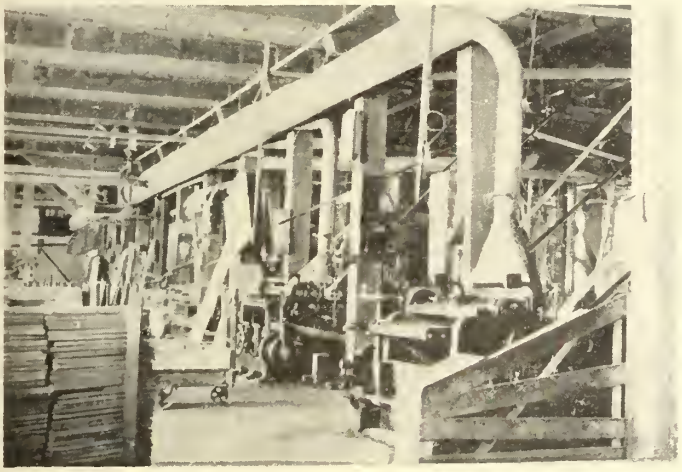
He certainly does. He pays the difference between what he might be getting and what he is getting paid for his work. The more you know and the more thinking you can do for your work, the more you are eventually going to be paid. Then,too, the more you know and the more thinking you can do for your boss, the sooner will he put you where you can supervise the work of others and be paid accordingly. Do your own thinking!

The man whose main aim at work is the weekly stipend will never get anything else unless old good luck takes a liking to him.

The Customer is Always Right

Good-will of Buying Trade Desirable Asset—North American Furniture Company have built Substantial Business on This Foundation—Plant Well Organized and Equipped Welfare and Comfort of Employees Not Overlooked

More than one successful business has been built on the premise that the customer is always right. Without regard to the character of the complaint or the merits of the case, the customer's story is accepted at face value and a satisfactory settlement made. That this policy is productive of a large volume of business, has been amply demonstrated in the case of the North American Furniture Co., Limited, Owen Sound, Ont., which since its inception some ten years ago, has lived



General view in plant of North American Furniture Co., Limited, Owen Sound, Ont.

up to this principle in a most liberal manner. Naturally it presupposes a well-designed, honestly-made product, for it would be ruinous for any concern to even attempt to stand behind a line that was fabricated in a careless, slipshod manner or which could not be counted upon to give satisfaction under average conditions.

In discussing their policy with the "Canadian Woodworker and Furniture Manufacturer," the manager, J. A. Minchner, intimated that the retail furniture dealers appreciated this attitude on the part of the North American Furniture Co., and that with one or two exceptions there was no evidence of any attempt to take advantage of this policy. In the case of the chronic kicker, when once it was found impossible to satisfy him, a polite intimation was forthcoming to the effect that his orders were not looked upon with favor.

Comparatively Young Organization

The North American Furniture Co., Limited, was organized in 1910 and has made steady progress from the first. Today it is recognized as one of the most progressive furniture manufacturing industries in Canada. The building and the equipment is thoroughly modern, the factory itself being an imposing four-storey structure 400 x 60, well lighted and having exceptionally high ceilings. These features tend for greater comfort and convenience on the part of the employees as well as having a desirable effect on production.

Before selecting the machinery, a thorough study of the methods and equipment of some of the best American furniture factories was made, and the knowledge thus gained was put to good advantage. Some of the principal machines are as follows:— Double-end tenoner, automatic turning lathe, stickers, single and double surfacers, sanders of various types, ball bearing shaper, automatic glue jointer, revolving clamp carrier, band saws, resaw, three DeVilbiss sprayers, etc. This equipment is so arranged that a semblance of straight line production is secured, all the stock moving in one direction.

Raw Lumber is Conserved

The kiln consists of five compartments 35 x 80 feet, each compartment being used for a different wood. In this way each wood receives special treatment, as it should. The cars of dry lumber are first permitted to cool and set and then are run into the breaking-out department, which is at the far end of the factory. A slight drop in the tracks makes it easy to move the cars. In the breaking-out department there are three sets of swing cut-off and power feed rip saws. One cuts nothing but high-grade stock, such as gum, walnut, etc., another handles all the core material, while the third set handles all the crating and other rough material. One advantage of this is that the men operating each set specialize in one phase of the work and are thus able to handle the stock coming to them to the very best of advantage. It also permits of an efficient arrangement of the equipment, for the bulk of the stock from any one set of saws goes through practically the same operations, permitting the equipment to be placed accordingly. Thus one finds the automatic glue jointer in line with

Employees rest and cloak room fitted up by North American Furniture Co., Limited

the saws handling the core stock. As a result handling costs are kept very low.

As the machined stock reaches the far end of the factory, it is taken to the assembling floor and from there to the finishing department by a special elevator.

This particular conveyance is used entirely for handling material between floors. To avoid confusion and delay, another elevator has been provided to carry the completed articles to the shipping floor. This gives a slight indication of the efficient lines along which this plant is organized.

Plant Organization Not Overlooked

Mr. Minchner is a firm believer in systemization, but sees the danger of over-organization with its accompanying red tape. As might be expected, the work moves along freely and smoothly, without the use of multitudinous forms, yet production is always under close control and every phase of each operation is subject to close check. A special perforated form accompanies each order as it starts through the plant, and as it progresses from department to department, the particulars are noted and a section of the form filled in, torn off and sent to the office. This information is entered in a book, which shows at a glance just how far along each lot is. In case something is required in a hurry, it might be a complete order or just some one part which may be holding up an order, a special, red rush card is attached. Anything bearing this card is given precedence over all other work and put through as quickly as possible.

The North American Furniture Co., Limited

Order No. ____ Date ____ 191 When Started ____

No.	Article	Quantity	Wood

When X is marked on Blackboard with the above No., keep the time.

Swing Saws

Mark date when completed and return to office.

Foreman ____

Date Completed ____

Order No. ____ Date ____ 191 When Started ____

No.	Article	Quantity	Wood

When X is marked on Blackboard with the above No., keep the time.

Machine Room

Mark date when completed and return to office.

Foreman ____

Date Completed ____

Order No. ____ Date ____ 191 When Started ____

No.	Article	Quantity	Wood

When X is marked on Blackboard with the above No., keep the time.

Cabinet Room

Mark date when completed and return to office

Foreman ____

Date Completed ____

Order No. ____ Date ____ 191 When Started ____

No.	Article	Quantity	Wood

When X is marked on Blackboard with the above No., keep the time.

Finishing Room

Mark date when completed and return to office.

Foreman ____

Date Completed ____

Hold in White ____ Name of Varnish Maker ____

Form used to check progress of different orders

In the finishing room in order to maintain uniformity in shade and tone, special panels have been finished in what might be termed standard shades. These are kept prominently before the finishers and enable them to compare their work with the standard. These panels are about two feet by three feet, and sets showing the different woods and different finishes are found here and there throughout the finishing room.

All veneering is carried on in a special department. The veneer and crossbanding is carefully stored in racks in a dry, well-ventilated room. The usual run of veneer equipment is found, such as glue spreader, hydraulic press, taping machine, etc. A large hot box heats the cauls and other material before gluing, none but animal glue being used. After the veneered work has been removed from the retaining clamps and allowed to air-dry slightly, it is placed in a special panel-drying kiln and all the remaining moisture is removed. This kiln is kept at a temperature of 110°. Ventilation is maintained by means of a fan. The stock remains in the kiln from twenty-four to seventy-two hours, depending upon the thickness.

Favor Electric Drive

A little over a year ago a change was made from steam to electric drive. The group type of drive was adopted and eight motors totalling 280 h.p., were connected up. Since then they have had ample time to give this form of power a thorough try-out, and today they are sold to the idea of the electric drive for furniture factories. Not only does their power cost less, but they have found it convenient and reliable. Using electric power, it has been found that the factory refuse is sufficient to maintain steam in one boiler to take care of the dry kilns, glue heaters and in winter the heating of the factory. The steam plant is maintained in running order, so that should the electric power be turned off for any reason, or a break occur in the transmission lines, it would only be a short while before the steam engine would take up the load. Happily as yet such an emergency has not arisen.

The question of fire protection has not been overlooked. Not only is the factory completely equipped with automatic sprinklers, but fire buckets and various forms of extinguishers have been placed at strategic points throughout the plant. Fire hydrants and hose have also been located where they will be found convenient in case of need. As a final precaution a fire brigade has been organized from among the employees, and thoroughly drilled in its duties. Sometimes an alarm is sounded and it is not many seconds before a stream is playing on any part indicated.

Retaining Good Will of Employees

The company has always had the interests of their employees at heart. Every effort has been made to make their work pleasant and desirable. In addition, a watchful eye is kept on home affairs. In the case of sickness or trouble, help is forthcoming in a quiet,

NORTH AMERICAN FURNITURE CO., LIMITED

SPECIAL RUSH

Order No. _____ Date _____

Article No. _____

Completed in Machine Room _____

" " Cabinet " _____

Received " Finishing " _____

NOTE

Any job, having the above Order Number is to receive preference over all other work and must be rushed to destination without the least delay.

Special rush form, printed on red stock, used to hurry along an order or part

unobtrusive way that cannot help but commend those responsible to the heart of the recipient. A short while ago a comfortable, attractively furnished club and lunch room was completed and given over to the men. This is fully equipped with hot and cold water and heating appliances to take care of the lunches. The management also supplied a phonograph and a good assortment of records for noon-hour entertainment. The room itself is fireproof, having gypsum board partitions and a painted concrete floor. A supply of magazines, including the "Canadian Woodworker," daily papers and other reading matter, is provided.

The clubroom is situated about midway from the main portion of the city and outlaying districts, and is always open to the employees and their families to use for a rest room, should they so desire, when visiting or shopping down town. Needless to say, it is very much appreciated by the men, who are showing a fine spirit in assisting and helping to keep it clean and orderly. This is all the management requests, and should an employee persist in disobeying this rule he will be barred from using the room.

One of the newest developments is an attractive display room for the convenience of visiting buyers. This is finished in ivory and old gold, with decorations to match. Here is found, displayed to advantage, the complete line of the North American Furniture Co., consisting of medium and high-grade dining room, living room and bed room furniture in walnut, oak and birch, the better being finished in that attractive shade known as "Chrome Walnut." A sister organization, the Owen Sound Chair Co., Limited, is also making use of this display room to show their line of medium and high-grade chairs.

The Owen Sound Chair Co.

This latter firm was organized in 1912, with the same officials and directorate as the North American Furniture Co., but is conducted as a separate and distinct organization. The chair factory, while separated from the furniture factory by a lane or driveway, is practically a continuation of the latter building, being four storeys, 250 x 60 feet. The two factories are separate in every way, each having its own power plant, dry kilns, etc.

The equipment, which is up-to-date in every respect, consists of the usual run of chair factory machinery, and includes lathes of various kinds, shapers, band saws, special boring machines and an array of special sanders. The bending department, which is in a new building a little distance from the main factory, is equipped with a number of bending machines, two steaming retorts and a drying room, in which the bent stock is placed to set and dry. With the exception of veneered stock, all chair back and bent rims for Windsor and other chairs are handled here. Latterly they have adopted the plan of bending the back posts of certain of their chairs, instead of cutting them out on the band saw. The saving in material is obvious and a better post is the result.

Have Well Balanced Line

The product consists of numerous medium and high-grade chairs in both wood and upholstered seats. Also a line of Windsor chairs which is particularly attractive and naturally is in strong demand. A number of designs in substantial office chairs complete the list.

The same policies are followed in both organizations. At the present time this company is completing a rest room for its employees similar to the one in the furniture plant. The production of chairs is in charge of F. W. Harris.

The personnel of these two organizations is as follows:— North American Furniture Co., Limited; H. B. Smith, president; D. E. Macintyre, vice-president; J. A. Minchner, manager and of the Owen Sound Chair Co., Limited; H. B. Smith President; D. E. Macintyre, vice-president and F. W. Harris, factory manager.

Can You Make Your Sticker Earn More?

One of Most Important Production Machines in Plant—Handles Large Variety of Work—Tendency Toward Faster Feeds and Quicker Set-ups—Hopper Feed for Handling Short Stock

BY J. C. WILLIS

The superintendent of a furniture factory recently remarked that he was convinced that fully 75% of the work in his plant went through the sticker in some form or other. In a straight front dresser having a square frame, for example, practically all the items are machined on the sticker with the exception of the case top, gable and back panels and the drawer bottom. This only goes to show the importance of this machine for furniture work and the necessity for having a sticker which will carry a fair rate of feed and for having special heads and knives to cut down the time lost in changing from one run to another.

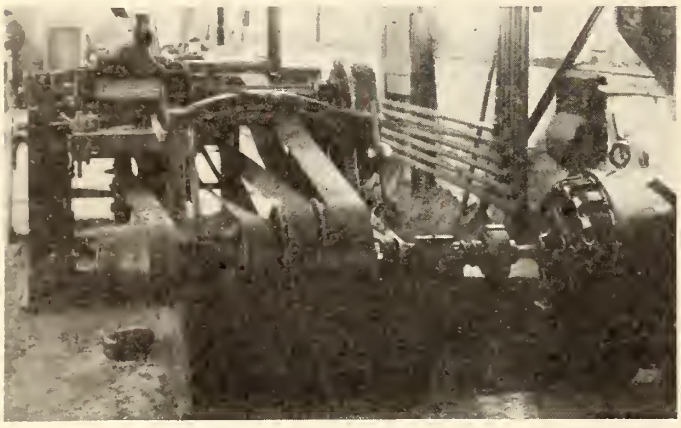
There are so many phases of sticker work in the production of furniture that it would require a lot of space to discuss them all. It is used for all manner of four-sided surfacing, plain or patterned tongued and grooved, rabbeted or bevelled, etc., from the smallest sizes up to practically the full capacity of the machine. Some plants make it a fixed rule to run all stock under 6 inches in width through the sticker, detailing it as required. A few points, which should be considered, are uniformity of size and contour of finished material and quality of finish at satisfactory rates of feed. Practical efficiency is what is required in production departments of a furniture factory, and the modern moulder is standing by its reputation and proving its efficiency in continuous daily operation.

What Feed Should Be Carried?

In a key machine of this type, the question of feed is important, perhaps not so important as in a moulding or flooring plant where long runs on one pattern are the rule and where rates of feed from 50 to 250 feet per minute are found; yet in its affect upon production and costs, the rate of feed is a factor which deserves special consideration. Where some of the older stickers handle the work at feeds of from 10 to 20 feet per minute, the newer machines give a good finish at feeds varying from 50 to 100 feet. For short runs such high feeds may not seem either

desirable or advantageous, but even on the shortest run, an increase in rate of feed means lowered cost and increased output. As much of the material in the furniture factory is handled in short lengths, feeds varying from 20 to 35 feet per minute are about all that could be carried.

It might be of intesest to call attention to the differences which exist between the earlier types of stickers and the modern machine. In the former type the lightness of frame and working parts, including the cylinders, journals, yokes, etc., resulted in vibrations which affected the finish of the stock and which precluded the use of any but the very slowest feeds. This has changed. To-day the heavy upper works are mounted on a solid base, sometimes a one-piece base. The journals are extra large and long and are mounted in heavy, well-lubricated bearings so that vibration is reduced to a mimimum, if not eliminated, and the quality of the work improved. All fast re-



Sticker being driven by direct connected motor

volving parts are perfectly balanced and the feed works actuated by a powerful drive which gives a positive feed. Guides and hold-downs keep the work in alignment in the machine and prevent chattering. All cutting parts are made read ly accessible by removable hoods or drop tables. Another noteworthy feature of recent development is tilting side-legs which allow the use of ordinary jointing heads for running bevelled matched stock. This feature makes the modern moulder particularly useful for bevelling stock for such items as pedestals for extension and parlor tables.

Saving Time in Making Changes

On account of the many different kinds of work the sticker is called upon to handle, there is probably no machine in the plant on which more time can be wasted in changing from one set-up to another. Where the operator is called upon to grind and work out his own patterns from thick knives, the setting-up time is often out of all proportion to the actual work to be run. Time is a factor which must be reduced and conserved in order to keep down production costs. The equipment, construction and operation of a modern moulder all tend for lowered costs, increased production and quality finish. Contrast the plant in which the sticker operator must make a set-up for every change in pattern, with one which has forty-eight special set-up heads. In the latter plant all the operator does is to take a slip-on head, which has been fitted in the grinding room, put it on the pull-out spindle and make the necessary adjustments of guides, hold-downs, etc. A set-up of this kind takes very little time in comparison to one in which the operator must bolt the knives on the head and make various adjustments before he secures the dimensions and details required. With the slip-on type of head, the operator is certain that the cutters are in balance and that good work will be produced. Again, while the machine is running on one pattern, other slip-on heads can be fitted up and held in readiness for the next run. It will be seen, therefore, that the time required to set up can be cut down to a small item.

Milled Bits and Hopper Feed

In considering milled-to-pattern bits, it is well to bear in mind that the bit can be used almost its entire length because of special devices for holding them in the head and patterns run to-day will match those run a year from now or a year before, as the milled bit always remains the same, something which is impossible with the old style ground knife. Faster feeds are made possible by the use of milled bits furnished four or six to a head. They are clamped in seats provided in the head and as nearly as possible to an even tracking. The bevelled ends are then ground equally and in some cases jointed in the grinding room after which the head is ready for use. In other cases the head is put on the mach ne and clamped in position in its relation to the guide, the jointer is attached and a stone, shaped approximately to the contour of the cutting edge of the knife is inserted. The head is turned slowly by hand and the jointer stone cut exactly to the shape of the knife. Then the machine is run at full speed and the stone adjusted to the head until the knives just touch. Then the jointer is removed and the machine is ready for operation. With this method all knives are brought to the same cutting circle and, therefore, cut equally, giving a better finish at higher feed than with one or two knives making uneven cuts at each revolution.

An attachment which has been used to quite a large extent on boxboard resaws and which has been adopted to stickers, is the hopper feed table, whereby a continuous stream of stock is kept going through, increasing the output of the machine. The operator sees that the hopper is kept full with material. He does not have to over-work himself to do this as he can handle a number of pieces at one time and is not required to move as fast as if no hopper has been provided. Stock formerly run in long lengths can be dimensioned in the saw room, leaving all waste and cull pieces there and then only the useable material run through the sticker. Such stock as table legs, chair legs, table aprons, drawer fronts, and sides, door stiles and cross rails, phonograph cabinet mouldings and work of a similar nature can be handled to advantage on an up-to-date sticker.

Driving Screws on Quantity Basis

Special screw-driving equipment is proving its usefulness in many plants. With Some of the types of screw-driving machines on the market such as the Reynolds, the screws are dumped in a hopper from which they are carried down to the driving bit and are there ready for instant use. Where a lot of screws are to be driven, a machine of this kind would seem to be desirable as it can do the work of six to eight men driving by hand. This is one machine that might be used advantageously in many departments in the modern furniture factory.

Production Control in Furniture Factories

Lower Costs and Increased Production Result From Efficient Routing—Items Entering Into Production Control—How all Factors are Handled—Analysing Delays and Wastage—Keener Competition Requires More Efficient Methods

by JAMES J. MARTINDALE*, Detroit Mich.

Every factory has some kind of production control. Therefore, it must be borne in mind that it is quite possible certain of the elements discussed here are already in effect in many shops. Further it is believed that the complete general methods described are possible of application to all woodworking factories. Each shop, however has its own peculiarities and a form which fits a condition in one does not necessarily satisfy similar demands in another shop. Every job of production control development is a special one—special to the plant in question. Furthermore, in introducing new methods the human element must always be reckoned with. The plan of installation must be carefully considered and more carefully carried out. It is a job requiring experience in the handling of similar cases.

Woodworking factories of today lack many of the essential elements of a control of production. A weak control causes some of the following results:— 1.Use of verbal orders; 2. Spasmodic production; 3. Too frequent and in many cases unnecessary switching of production crews; 4. High unit costs; 5. Delayed shipments; 6. Dissatisfied customers.

Elements of Production Control

A production control to remedy the above evils, must have the following qualifications:— 1. Simplicity Requiring but few clerks and a minimum of system or red tape. 2. Elasticity: To satisfy demand for increased production, and when necessary, quick changes in planning. 3. Accuracy: Must be built up on reliable information and turn out the product in specified time, quantity and quality. 4. Allow of minimum output costs: (a) Eliminate majority of material follow-ups on the part of the foremen and unnecessary foreman conferences. (b) Permit as "long runs" as possible. (c) Permit and encourage most economical use of labor. (d) Encourage improved methods. (e) Increase production per employee. (f) Shorten time of production.

The essential elements of a production control are developed as follows:—These elements are shown in that sequence in which they might be installed in the average plant. A discussion presents the main characteristics of each element or set of elements under their respective headings: Material Control; (a) Requisitions; (b) Perpetual inventory on: Raw material, Expense material, Finished parts, Complete output; (c) Control of material in process.

Necessity of Following Work

It hardly seems necessary to point out the advantages of the control of material in its various stages, yet unfortunate to relate, a number of shops have been served where a lack of such control existed. A planning system to be successful must have a control of material. Without such control, the production may be likened to that of a boiler plant suffering from intermittant coal handling. Steam, output of the boilers, is most irregular as is shown by the graphic recording gauge. If such a simple device could be used to record the output of the average woodworking shop, the woodworking industry would be in a much better producing stage than it is at present.

The issuance of instructions effective on a certain date, that no material is to be dispensed without a properly signed requisition, puts a stop to unnecessary visits to the stock rooms, reduces stock demands and soon installs the requisition writing habit. Figure 1 illustrates a convenient stock record sheet (size 8½ x 11).

A finished parts stock room can be maintained with considerable advantage in many furniture shops. Its use relieves the production floors of many loaded trucks and insures delivery of the part when required for assembly.

A traveller or card to accompany material (for control of material in progress) serves the purpose of identification, furnishes a continuing count and can be used to show the stages of processing. Such a form is shown in Fig. 2. A traveller should be of comparatively large size (5 x 8 is rather a well dimensioned form) to prevent its being lost. It also should be colored for easy recognition. Frequently where the card is liable to be soiled in handling, it is advisable to place it in a manila envelope for protection. In many planning departments the operations could be placed on the traveller in sequence before sending the traveller to the department. If such a procedure is inadvisable, this information can be placed on the card by the departmental clerk or foreman before it is given out.

Proper Sequence of Operation

The placing of the operations in their correct sequence on the traveller reduces the possibility of wrong processing. On some other parts it is absolutely necessary that, say operation 2 be performed before operation 3, because if the reverse sequence takes place the part would have to be scrapped. When the finished date is placed opposite an operation together with the number finished, the completion of the operation is indicated. The truck load of material is then ready to be moved to the next operation.. The proper design and use of a traveller can only be specified after a careful analysis of the plant operating conditions.

Operation Sheets: Operation sheets when filled out with required information become the Bible of production. They should be bound in a loose-leaf manner and carefully filed for ready reference. The paper should be of good quality to withstand the continual reference and turning of leaves. A form of operation sheet is illustrated in Fig. 3. In many cases this sheet should be of lettered size (8½ x 11) in order to permit of convenient filing and the recording of necessary information.

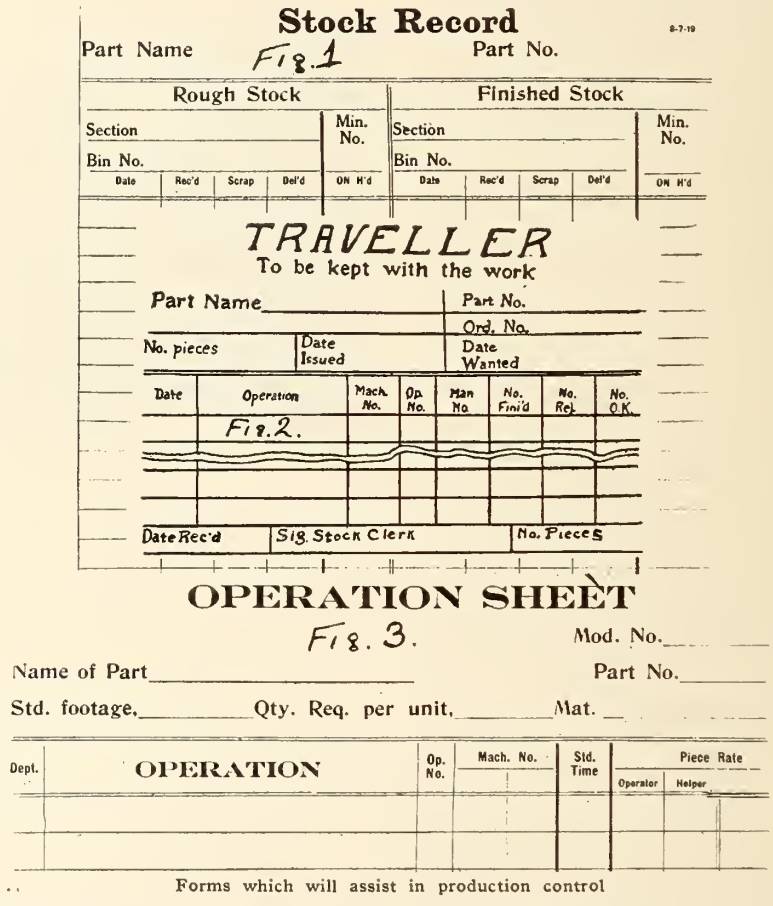
The development of operation sheets requires the

*Vice-president James E. Morrison Co., Industrial Engineers.

noting of all operations in sequence. This further entails a development of standard nomenclature for the various operations. This in itself is quite a valuable addition to shop control as it is frequently found the same operation will be indicated by the use of two or three or even four different names—thus causing unnecessary confusion. The operation sheet should have spaces for standard times and piece rates (or premium rates) and then becomes the official file for standard times and the incentive rates.

Bill of Material or Cutting Bill

Bills of material: A bill of material furnishes complete information as to the parts entering into the make-up of an article. A sample is shown in Figure 4. It should specify the kind of wood, number of pieces per each unit, finish and rough sizes. When issuing orders to the shop, such a bill of material should accompany the order for ready reference by foremen interested. For such a purpose it is well to have the bill of material sheets prepared by type-writer or draftsman in order to permit the obtaining of blueprints for issuance. In time the foremen will have received blue-prints of bills of material covering all articles manufactured. These should be kept in a loose-leaf file supplied to the foremen for the purpose. Any corrections to be made on these bills of material should be made by some person, designated by the production or superintendent's office, on all sheets affected and date and initials of party making alteration noted after change. This form can well be in letterhead size (8½ x 11) for greater convenience.



Forms which will assist in production control

General Office Orders: General office orders give the plant authority for the manufacture of a certain number of different units such as 100 dozen of model 30-A chairs or 200 model X phonograph cabinets. They are issued by the general manager to the superintendent and production department. It is essential that the shop should be loaded sufficiently far ahead with work contained on general office orders in order that plans can be made to carry forward production most economically.

Purpose of Shop Orders

Shop Orders: Shop orders are based upon general office orders and give the detail to the shop as to the number and name of parts to be made to fill the requirements of the general office order. They are issued by the production department under direction of the superintendent to the foremen of all departments affected. The stock of parts in finished parts stock room should always be considered by the production department before issuing shop orders.

In many wood-working shops it will be found advisable to issue the shop orders as a Part Order Progress Record rather than one order or sheet covering many parts. It is called a Part Order Progress Record because it fills both the function of a Part Order and a Progress Record of the processing of the part. Such a sheet will give authority to the foremen of departments affected for the manufacture of a certain number of pieces of one part only. This means that if there are 25 parts required to fill the demands of the general office order for a particular article, there will be issued 25 Part Order Progress Record sheets.

The clerk or foreman should carry forward a record of the progress of the parts by noting on the order the date and quantity finished under each operation. This information is obtained from the job tickets. When the part order is completed the sheet should be so marked by the foreman in charge and forewarded to the main office for filing. A sample form is shown under Figure 5. It can also be used in the same manner as authority to the assembly department to assembly the number of units called for by the General Office Orders.

Another type of order frequently called plant, alteration or repair orders have to do with plant or machine repairs or machine installation. They carry a different series of numbers than the General Office and Shop Orders and should be distinctively colored or marked to quickly distinguish them from productive orders.

Accurate Recording of Time

Job Tickets: In obtaining a control of labor and labor costs, it is most advisable that a labor work ticket be issued to a workman for each job upon which he is engaged instead of one work ticket for the whole day's work of each employee. Such procedure enables the cost department to quickly file the various job tickets to their respective employee numbers and later to the order number. This permits the obtaining of quick costs with a minimum of labor or transcribing of information.

Of course there are exceptions to this rule as where a man has many dissimilar jobs during a day—perhaps 10—15. In this case he should be given only

one daily productive job ticket and distribution of his time to the jobs can be forgotten as more money would be lost in an endeavor to obtain such distribution than would be gained.

A sample form of job ticket which has been used in the woodworking industry is shown in Figure 6. A job ticket should be of sufficient size to enable the clerk to so incorporate his information that it is perfectly readable by all parties through whom the ticket passes after leaving the workroom. It should be in duplicate, the duplicate being of different color than the original.

Non- productive job tickets are necessary. These should be of a color different from the production tickets, probably red. They should be issued whereever an employee is a non-productive worker, or wherever a productive worker is temporarily engaged on non-productive work, or is held up in producing by delay of material or broken-down machinery. A comparative compilation of non-productive hours, period by period, is of considerable value in controlling costs.

Development of Standard Times

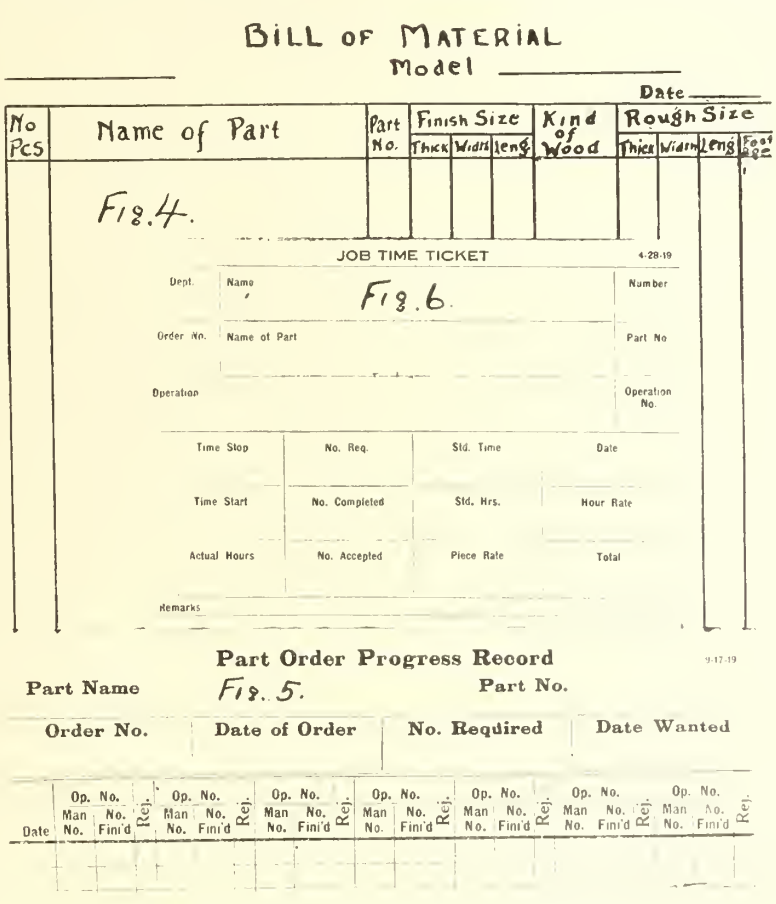
This work is most important and is something which is going on continually in all up-to-date plants. There is one best way of doing any operation. It is advisable to determine this way and then have the operator perform the work in this manner. The use of jigs, fixtures, and special machines can frequently greatly increase output. If by the use of such appliances the rate of production can be raised, naturally it would be foolish to set a standard time on the operation until the improvement has been accomplished. In this regard care must be exercised to not spend more money than the savings warrant.

However, it will be discovered that many operations are being performed in a proper manner. These should be immediately covered by standard times and recorded on the operation sheets mentioned. The use and advantages of standard times have been rather fully explained in previous articles published by the Canadian Woodworker in the August, September, October and November issues of 1920. Therefore, it does not appear advisable to enter into a lengthy discussion on this subject in this article.

Standard Hours of Work Ahead

The development of standard hours of work ahead is accomplished by taking the orders which are in front of any activity and translating them to standard hours by the use of standard times. This information is most valuable as it enables the planning department to obtain a true knowledge of the work ahead of each machine, group of machines, or departments, and to anticipate any "neck in the bottle" congestion. It is probable that certain machines or departments will be found to have too much work ahead of them to be accomplished in the required working time. To turn out the orders in the specified period requires overtime on the part of the departments affected, the introduction of other methods, or new machinery.

The development of standard hours of accomplishment is obtained by translating work done into standard hours by the use of standard time. The information on the job tickets is used for this purpose. For instance, if 1200 pieces on a certain operation were manufactured in a day and the standard time is .7 hours per 100. then the standard hour accomplishment in this case is 8.4 hours This standard hour accomplishment added to similar standard hour accomplishments of the other producing units in a department, will furnish a complete standard hour output figure for that department for the day. The standard hour measure of result is the only true comparable method.


BILL OF MATERIAL

Model

Date

No Pcs	Name of Part	Part No.	Finish Size Thick	Width	Leng.	Kind of Wood	Rough Size Thick	Width	Leng	Feet

Fig. 4.

JOB TIME TICKET 4-28-19

Dept. Name Fig. 6. Number

Order No. Name of Part Part No

Operation Operation No.

Time Stop	No. Req.	Std. Time	Date
Time Start	No. Completed	Std. Hrs.	Hour Rate
Actual Hours	No. Accepted	Piece Rate	Total

Remarks

Part Order Progress Record 9-17-19

Part Name Fig. 5. Part No.

Order No.	Date of Order	No. Required	Date Wanted

Date	Op. No. Man No.	Op. No. No. Fin'd	Rej.	Op. No. Man No.	Op. No. No. Fin'd	Rej.	Op. No. Man No.	Op. No. No. Fin'd	Rej.	Op. No. Man No.	Op. No. No. Fin'd	Rej.	Op. No. Man No.	Op. No. No. Fin'd	Rej.	Op. No. Man No.	Op. No. No. Fin'd	Rej.

Accurate records are a vital necessity in modern plant

Development of Efficiency

The development of efficiency of man, group, department or plant is necessary in order to determine production possibilities of these various activities. This is naturally obtained by the relation of the standard hours of accomplishment to the actual hours used in obtaining such standard hours. If a department is operated at sevent five per cent. efficiency and the standard hours represented by new work is 15,000, then the actual hours of work ahead of the department is 20,000. With a department pay-roll of 50, the time required to complete this output would be approximately eight weeks. With this information the planning department is thus able to determine the production program.

This determination further shows up the possibilities in increasing the worker's efficiency. In the case assumed, if the efficiency was increased from 75% to 90%, the reduction in actual hours of work ahead would be approximately 3,000. Using the same payroll of 50 people, this gain in efficiency repre-

sents a reduction in time of the orders in process of approximately 1.2 weeks.

Assembly Progress Record

In the methods thus far outlined, it appears advisable to carry in the production or superintendent's office only the assembly progress records. This record will be maintained from information taken off the assembly crew job tickets or final inspector's daily report as to completed output. Such a progress record will answer the great majority of questions as to the progress of orders. If any further detail is required, it would only be necessary to make a visit to the various departments and in a short time ascertain the conditions, from the Part Order Progress Record sheets, of parts manufactured.

In large shops it might be advisable to consider the installation of graphic control board where the progress of the orders through the shop are shown by various colored markers. Considerable expense can be devoted to progress records and management of the average woodworking shop should be careful as to the extremes to which this may be carried.

Analysing Delay and Wastage

Many managers fail to realize the enormous losses occurring every year in avoidable delays to production. This loss is difficult to ascertain and visualize unless methods are in vogue which allow them to be first obtained and then summarized. Job tickets, as previously described used under strict adherence to rules will furnish the vital facts.

All delays should be listed and divided into two sets. One will have a reason for their happening and the other set will be in the nature of excuses only. The second kind of delays are not allowable. A fair reasonable figure should be determined for the first kind and expressed as a percentage of the available hours of the plant and department. When this percentage has been agreed upon, plant management should be continuously urged to equal and better it. It is a standard of accomplishment.

In all woodworking plants there is considerable waste which is unnecessary. It is advisable to determine both the average necessary waste and the unnecessary waste, and key the organization up to the endeavor to eliminate all unnecessary waste.

A standard percentage of waste for various kinds of output is a figure which can be obtained upon analysis. A reduction of unnecessary waste in woodworking shops to a minimum, is much more necessary today due to the high prices of labor and material. Furtherfore it is an economic crime to waste such a valuable resource as lumber. It should be the duty of the woodworking industry to establish minimum waste percentages and hold out strong inducements to their executives to reach this figure.

Incentives for Foremen and Workers

The incentive for foremen can frequently be based on the accomplishment of the workers directly under their charge, and the reduction of delays and unnecessary waste to a minimum. Incentive for workmen is based upon their efficiency. An incentive, if properly applied, will bring out all the latent possibilities in employees. Lasting and beneficial results can be obtained from its use. Such a subject is an article in itself and cannot be discussed in the space permitted here.

Inspection of the accuracy of jigs and fixtures should be made, perhaps once every month. A certain amount of floor inspection is advisable. Such inspection keeps the employees on their mettle as to workmanship and saves many a dollar in scrapped output. Final inspection of the article before it leaves the assembly department for the finishing department is necessary.

All inspection should be governed by certain specifications and understanding as to quality. A daily final inspection report should be made to the superintendent's office. This question is very important. Before making any drive for production or lower costs, inspection methods must be carefully considered and developed.

The finishing departments (varnishing, upholstering, etc.,) of a furniture factory have their own peculiarities. Although all the principles here outlined are applicable, yet the use in such departments of one or two of the forms illustrated may not be advisable.

Does not Require Large Staff

It might appear to handle such plans as outlined above, a considerable force would be required. This conclusion is erroneous. Considering the average Canadian furniture factory, once the various elements of control are established it would only be necessary to have in the superintendent's office one assistant. The man should be production clerk and time study man and exercise detailed supervision of the production control. He might require a clerk (depending upon general plant and main office conditions) to assist in handling the Part Order Progress sheets, Operation Sheets, Bills of Material, Job Tickets compilation and efficiency information. A stock clerk is necessary. His time is, however, seldom fully occupied with stock duties. He therefore, can be called upon for considerable assistance every day.

Necessity for clerks in the plant departments is dependent upon the type of foremen and number of employees. When the outlined production methods are in operation the foreman finds himself much relieved from previous duties and can devote some of his time to certain clerical duties of the new methods.

In general however, it is bad practice to ask a foreman to perform clercial operations and unless the force of employees under his charge is rather small, a clerk should be supplied for that purpose. Frequently two or even three small adjacent departments can be handled by one clerk with the help of the foremen in emergencies.

Competition and the consumers' demand for low prices will force many a manufacturer to better methods whether he likes the thought or not. The wide awake executive will put his house in order before conditions compel him. It can be stated without reservation the methods outlined if properly installed and fostered, will return large dividends..

Small leaks sink great ships—neglect of detail will entangle and swamp the largest business.

To have a very fine finish on your cabinet work use O O paper or cloth. The abrasive is so fine that it will leave the wood with a good polished surface.

Woodworkers Get Together on Costs

Prices on Special Millwork Should be Based on Accurate Tests—Applying Fixed Burden Charges on Definite Units—Should Estimator or Manager Make Prices?

A representative gathering of woodworkers met recently in Toronto to discuss millwork costs and correct burden application. This meeting was called by E. R. Eaton & Sons, Orillia, Ont., Canadian director of the Millwork Cost Bureau, in an endeavor to arouse a greater interest in this important subject. W. B. Flint, Chicago, secretary of the bureau, was present and gave an interesting and instructive outline of cost work in this field.

He first traced the growth of the Millwork Cost Bureau, which is a co-operative association of sash, door and millwork manufacturers organized to promote cost knowledge. The idea originated eight years ago when twelve millwork manufacturers in the Middle States got together and engaged cost accountants to make a detailed study of cost work in each plant and to devise some efficient uniform system which would be applicable, with slight modifications, to all plants. Other woodworkers wanting to come in on these cost studies, the scheme was enlarged and the Millwork Cost Information Bureau, now known as the Millwork Cost Bureau, formed. Since then the membership has grown until it now embraces 500 woodworkers in the United States and Canada.

How Cost Figures are Compiled

The cost data issued by this organization is the composite average costs based on figures submitted by the 500 members. Cost exhibits, covering various classes of special millwork, are sent in by members. These are assembled, analyzed, the times studied and an average composite figure issued. Mr. Flint claimed that these composite costs were more representative than actual cost studies made in any one plant, and as such provided a better foundation on which to base prices.

The reason for this is that the cost of any job will be found to vary almost from day to day in each plant. One week the men will take so much time to do a certain piece of work. The next week they might do it in half the time or might take longer. Estimates based on such varying cost factors are of doubtful value, while estimates and prices based on the average costs taken from 500 plants are applied on a known standard.

Fixed Overhead Charges

There are many ways of applying overhead. Some add a percentage on lumber; others on labor, while still others on labor, plus material. Percentage is not the most equitable or the most accurate way to apply overhead. A machine may be operated by a 60 cent man one day and a 40 cent man the next. The actual overhead is the same in each case but the burden charge will vary if it is applied as a percentage on the per-man hour rate. It costs practically as much to handle 1000 feet of oak as the same quantity of hemlock, yet if the overhead is applied as a percentage on value, the charge will be nearly three times as much in one case as in the other.

A better way is to divide the overhead and apply it as a fixed charge on a definite unit. On lumber add a fixed charge per M feet to the f.o.b. price. If the material goes through the kiln, add a fixed kiln-drying charge per M. This gives the lumber cost at the factory door. In the plant add a fixed burden charge, not percent, per man hour. This charge will vary for machine and cabinet men. Then for commercial burden add a percentage on the factory cost which really amounts to a fixed charge per dollar. Thus we have three definite units for applying burden,—unit per M feet, unit per man hour and unit per dollar on factory cost.

Average Burden Factors

It has been found in studying the figures submitted by the members of the Millwork Cost Bureau that the average burdens are $5.30 per M for yard burden, $6.00 per M, kiln burden, 57 cents per hour machine burden and 34 cents an hour, bench burden, while the commercial burden averages 20 per cent on factory cost. The average wage paid is 60 cents per hour for machine labor and 66 cents per hour for bench labor, average set-up for sticker work, $1.32 net.

Mr. Flint emphasized the value of basing higher prices and estimates on standard lists. A woodworker hires an estimator and hopes against hope that he has secured a man with almost supernatural knowledge so that he is able to estimate, or guess, not too high so as not to lose business, neither too low so that money will be lost on the order. It is out of the question to expect one man to be able to keep in close touch with labor and material fluctuations on all classes of work. The better way is to have certain standard lists and for the manager to fix the price by instructing the estimator to add or subtract a certain percentage from the prices shown. These lists would be based on a definite cost factor. By figuring costs and then adding a profit, competition may be met in an intelligent manner, as, if the business is considered desirable, the amount a person may cut before reaching the cost line, is definitely known.

Who Takes the Chances?

Why should a woodworker hire an estimator and then gamble by backing him with his profits and even with his capital? It appears to be far more logical to establish certain known costs and then base the selling price on these figures and tell the estimator that these are the prices at which he must figure the material or the items in the various jobs. In this way the person with the most at stake is fixing the prices, not the estimator who has little or nothing to lose.

The estimating course which is conducted in connection with the work of the Bureau, was described by Mr. Flint. This is a service to members, who may enrol any number of their employees. The work consists of a study of plans, the taking off of quantities and the application and use of Cost Book A and the universal price list. The student is given in addition a thorough training in the taking-off of material, in drawing up specifications and in making out estimates. Cost Book A is in reality a basic cost list for special millwork details.

In the general discussion which followed Mr. Flint's talk, the comparative cost estimates which have been appearing in recent issues of the "Canad-

ian Woodworker," were used to show the lack of uniformity which exists as to the ideas of cost and to the necessity forr woodworkers giving greater attention to this end of their business. All present displayed a lively interest in the work of the Bureau and in the points outlined by Mr. Flint, and a number intimated their intention of becoming members.

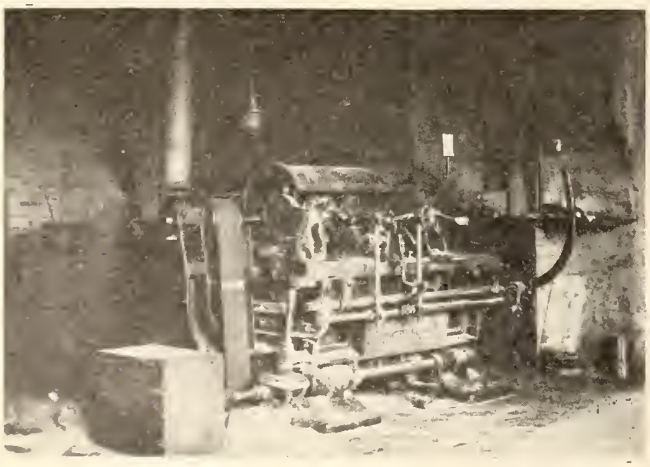
The following is a list of those in attendance:—
W. P. Flint, Millwork Cost Bureau, Chicago, Ill.
W. A. Hadley, S. Hadley Lumber Co., Ltd., Chatham, Ontario.
Chas. S. Dunnett, Walter Piggott Lumber Co., Ltd., Windsor, Ontario.
James Walt, Robert Stewart Co., Ltd., Guelph, Ont.
Chas. S. Anglin, Chas. S. Anglin & Co., Kingston, Ont.
Wm. Pillar, Chas. S. Anglin & Co., Kingston, Ont.
J. H. Eaton, J. R. Eaton & Sons, Limited, Orillia, Ont.
E. R. Eaton, J. R. Eaton & Sons, Limited, Orillia, Ont.
A. L. Bennett, P. W. Gardiner & Sons, Galt, Ont.
M. J. Bray, Midland Wood Products, Ltd., Midland, Ontario.
John H. Cole, Knight Bros., Burk's Falls, Ont.
F. Hutcheson, Muskoka Wood Mfg. Co., Huntsville, Ontario.
Jaffray Smith, John B. Smith & Sons, Ltd., Toronto.
Frank A. Kent, Seaman, Kent Co., Limited, Toronto.
E. C. Woods, Kingston Road Lumber Co., Toronto.
H. W. Hope, Hope Mfg. Co., Toronto.
Alex. Rhind, Simpson Planing Mill Co., Toronto.
H. M. Duthie, Simpson Planing Mill Co., Toronto.
W. W. Abra, John C. Gilchrist Lumber Co., Toronto.
J. C. Gilchrist, Jr., John C. Gilchrist Lumber Co., Toronto.
T. H. Hancock, T. H. Hancock Co., Limited, Toronto.
F. Louden, T. H. Hancock Co., Limited, Toronto.
Allan Watt, Watt Milling & Feed Co., Ltd., Toronto.
W. J. Archibald, Watt Milling & Feed Co., Limited, Toronto.
S. H. Bennett, Watt Milling & Feed Co., Ltd., Toronto.
James A. Barclay, Builders' Moulding Co., Ltd., Toronto.
T. E. McMurray, Builders' Moulding Co., Ltd., Toronto.
W. C. Gardiner, Builders' Moulding Co., Ltd., Toronto.
T. E. Rathbone, George Rathbone Co., Toronto.
D. D. McNeil, George Rathbone Co., Toronto.
W. C. Laidlaw, R. Laidlaw Lumber Co., Ltd., Toronto.
W. Warren, R. Laidlaw Lumber Co., Ltd., Toronto.
R. G. Millen, R. Laidlaw Lumber Co., Limited, Toronto.
J. C. Thompson, Standard Planing Mill Co., Limited, North Bay, Ont.
L. R. Wright, "Canadian Woodworker," Toronto.

Development of Turning and Shaping Lathes

Specially Adapted For Quantity Production of Turnings—Replacing Band Saw and Shaper on Square and Octagon Work—Intricate Designs Handled to Advantage in Quantities—Leg-forming Machine for Cabriole Shaping

By L. D. TAYLOR

Is it correct to say that the demand for certain styles of furniture has been responsible for the development of special equipment or has the special equipment made possible the manufacture of certain designs, which afterward have been popularized? Regardless of what your answer may be, special equipment has been responsible for the production of certain attractive period lines in quantities which brought the price down within reach of the average person. This is particularly true of the automatic turning lathe and the automatic shaping and forming lathe.



Automatic turning lath. 'n plant of Malcolm & Hill, Kitchener, Ont.

The popularity of styles calling for special turnings, including squares, hexagons, octagons and ovals, as well as rounds, has forced many furniture manufacturers to consider the problem of the quantity production of these items. The methods in vogue in many plants, such as hand-turning and special shaper, band saw and buzz planer operations, were found to be too slow, too inaccurate and too costly. For these reasons the automatic turning lathe with its high productiveness, its accuracy in quantity reproduction and because of its ability to handle the most intricate designs, has met with a ready demand.

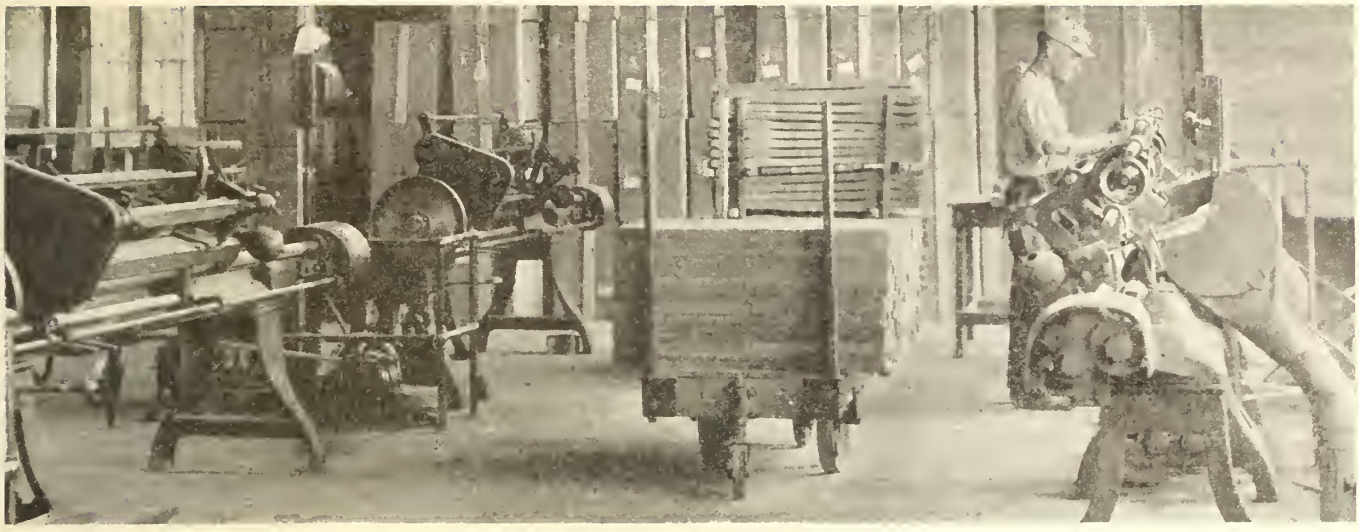
Capable of High Production

In the hands of a capable operator, the automatic turning lathe can handle a wide variety of work to good advantage. With such a machine one man will produce from five to ten times as many round turnings per day as a skilled hand turner. On other classes of work he will turn out from ten to twenty times the number of squares or octagons obtainable from the band saw or shaper. This means a saving in labor, a lowered overhead per piece as well as increased production.

To one not familiar with the automatic turning lathe, a brief description of the principles involved might be of interest. Briefly, the machine consists of a pair of centres and a special cutter head. The centres are mounted so that the work may be moved forward to engage the cutters, and for round or oval work, revolve against the rapidly-moving knives. The cutting is done by cutter heads mounted on a large spindle. The heads are slotted and are made in sections so that for a short-cut only a small section is used, while for a longer one more sections would be added. The cutters, which like moulded knives are interchangeable for different designs, are mounted on special cutter blocks which hold them at an angle so as to give a shearing cut.

Shearing Cut Makes Smooth Work

The cut itself is similar to that employed by the hand turner, that is, a shearing one from the high point down. This is obtained by the angle at which the knives are mounted. Suppose a bead is to be cut,



One man attending number of leg-forming machines. Can operate lathe and sand output

two knives are used, one cutting from the centre or high point toward the right, the other one cutting from the high point toward the left. In this way every cut is downward and a shearing one regardless of the intricacy or detail of the design. It is seldom that one knife cuts more than two members. By combining a number of knives to give the required contour, all members are cut at one time. This is how such high productiveness is obtained.

It is usual in many shops to have a number of extra heads which are set up for what might be termed stock designs—turnings which are made over and over again. When this practice is followed, the set-up consists of simply placing the necessary head sections on the cutter heads, spindle and making a few simple adjustments. The operator soon becomes expert in handling and setting up this machine so that setting the knives for even intricate designs does not present any unusual difficulties.

Setting-up Box Saves Time

The setting-up box shown herewith will be found very handy. It is constructed of wood and is easily made. The three blocks carrying the arbor bearings are 1¾ inches thick by 8¾ inches high and 18 inches deep. The box is 47 inches long over all. One of the end blocks is not screwed to the box but is left free to move in and out. A strip is nailed along the back and bottom of the box to keep this end block properly lined up and to add strength to the box itself. The grooves for the bearings should not be cut in the exact centre of the blocks but rather at a point about 8 inches from the back of the box. The two stationary bearings should be placed 7¼ inches between centres.

By using three bearings, two stationary and one removable, you have the same principle in the setting-up box as in the lathe itself. Of course care must be taken to have the arbor tightly clamped in the stationary end bearing to prevent the head from dropping down when the loose bearing at the other end is removed. With a setting-up box of this kind, the knife maker can handle the cutter-heads more conveniently and in less time than with a box having only two stationary end bearings.

Shaping Lathe for Cabriole Legs

Mention was made in the opening paragraph of a special automatic shaper or forming lathe. This is used largely for making cabriole legs for Queen Anne furniture, though it can be put to many other uses. In operation it is very simple, a shear, cutting head taking care of all designs. A master pattern is used for each design. This is copied accurately and in detail, the reproduction being an exact replica of the original; thus all the fine curves and proportions of the master pattern are imparted to the product.

When the equipment is suitably arranged one operator can look after more than one machine or can operate the lathe and sand the finished pieces at the same time. This machine has reduced the quantity production of cabriole legs and similar items to a fine art.

Special box to facilitate set up of cutter heads

Comparative Raw Material Values

In dealing with the prices of raw material in his report covering the work of the Cost Accounting Department, Jas. E. Ferguson gave a few figures which show the rebound in values which has taken place since prices reached their lowest point. These figures also indicate how present prices compare with those of 1915. The figures, which are extremely interesting, are as follows:—

Material	Low	Change from low at Dec. 31	Change from 1913
Lumber	35% Dec	11.8 Inc.	104 Inc.
Glue	24% "	10. "	39.5 "
Hardware	22% "	1.6 "	119 "
Glass	54% "	None	19 "
Mirrors	28% "	25 "	83 "
Finishing	17% "	1.5 "	98 "
Packing	37% "	None	70 "
Upholstering	30% "	6 "	93 "

What to Do if You Want to Sit at the Boss's Desk

An Interview with Wallace B. Donham, Dean of the Graduate School of Business Administration of Harvard University

By BRUCE BARTON*

"Business is full of young men who seem to have ability; who work hard; who believe in their companies and are eager to get on," said Dean Donham. Their industry and faithfulness carry them to a foreman's position or a chief-clerkship. But there they stop. Why? Most often, I believe, it is because they approach every problem from the standpoint of the little part of the business with which they are familiar; not from the viewpoint of the business as a whole, and not from the employer's standpoint. They never imagine themselves behind the boss's mahogany desk, and ask, 'What is he trying to accomplish? What are the problems as he sees them? What would I be trying to do for this business if I had his responsibility?' They do not realize that if you wish to be an executive, you must think like an executive.

Answer These for Yourself:

Am I in a department where money is made?

How can I make more money for my employers?

Can I originate good ideas?

Am I able to think clearly and constructively?

Can I express myself clearly in conversation or in writing?

Am I able to grasp the executive viewpoint?

"You remember the story of the young man who came to see Lorin F. Deland. He complained that he had been with the same company for a number of years and had received only minor promotions. He wanted to enlist Mr. Deland's help in securing a better job. Mr. Deland agreed to solve the problem if the young man would promise to follow his orders exactly for a period of thirty days.

"'The company which employs you does a gross business of many million dollars a year,' Mr. Deland said to him. 'For the next thirty days I want you to give your entire thought to the question how you can increase its business by $50,000, or by $5,000, or even by $1,000.'

"At the end of thirty days the young man returned, rather crestfallen, to report that he had not been able to think of any way by which the company could increase its business at all.

"'Very well,' said Mr. Deland; 'let us take the thing from another angle. During the next thirty days find out some way in which the company can decrease its expenses by $10,000, or $1,000, or $500. A decrease of even a small amount in costs is equivalent to a very much larger increase in gross volume. Go to it now and find some way to save.'

"Again the young man went away; and again he returned to announce that in the whole thirty-day period he had been unable to conceive a single constructive suggestion. At this second admission of failure Mr. Deland threw up his hands.

"'Think what a tragic confession you have made!' he exclaimed. 'Here you are, in the very heart of a great organization doing business all over the country. The market for its goods is growing tremendously; other men are finding ways to add millions to its gross business. Yet you are unable, in a whole month, to discover any way to add a single dollar! It employs thousands of people, rents great buildings, purchases supplies in huge amounts—all of which implies the certainty of waste. Yet you are unable to suggest any way by which it can reduce expenses at all. Young man, I advise you not to let the general manager see you any more than you can help. For if he ever discovers that he is paying a salary to a man who has so little constructive imagination, he will certainly replace you with someone who can think as well as work.'

"If Mr. Deland had been illustrating the objects for which a school of business should work," Dean Donham went on, "he could hardly have done better. Every year several hundred college graduates come to us at Cambridge to fit themselves for executive positions in business. Many of them expect to be told, or to read in books, how to do business successfully; but our idea is entirely different.

"We start in, practically before anything else is done, by giving them a complicated problem to work out, such as a general executive must face. Such a problem as this, for example, which is taken directly from the recent experience of a well-known business executive, who operates two plants about twenty miles apart. The slump in general business cut his sales fifty per cent. How shall he readjust his operations to meet the difficulties presented by that slump? If he closes one plant, and operates the other full time, he may earn the dividend on both his preferred and common stocks; but he will be reducing his high cost inventory unevenly and entirely disrupting his force at the plant which is closed. By keeping both plants running half time he can handle his inventory more

*In the "American Magazine."

advantageously and hold together a nucleus of his organization in both places; but the expense will be so much higher that he will surely fail to earn his common stock dividend.

"Now, shall he shut down one plant, even though he disrupts his labor situation, because this will give him a better chance to run full time at the other plant and to earn dividends for his stockholders? Or shall he run half time in each factory, increasing his expenses and surely eliminating his common stock dividend, but working off his inventory at each plant, keeping his picked men busy, and holding his organization intact for the return of better times? Entering into the question is the problem whether he can continue to sell even as much as fifty per cent of his possible out- his dividends will have on his credit.
put, as well as the effect his paying, or failing to pay,

Willingness to Shoulder Responsibility

Nearly every department of modern business is involved in this problem—accounting, sales, finances, manufacturing and labor. We let these young college graduates wrestle with it for a couple of days. Then we ask for their solution. What would they do if they were the owners of that business, with the whole responsibility on their shoulders

"While they are still in a rather hopeless muddle we analyze the problem for them in its various aspects, to show the complexity and the interesting nature of the general executive's task. We keep them for two years analyzing all sorts of business problems and making up their minds how they would act if they were on the executive job.

"The other day an officer of a big corporation told me that he was about to be promoted, and that for several months he had been trying to train his successor.

"'I have two assistants,' he said, 'either of whom, I know, could hold down the job; but I cannot get them to think so. I cannot get them to put themselves in my place and really take responsibility. In otherwords, they think always from the bottom up, never from the top down.'

Have You Earned More Money?

"I do not know of any better illustration of the difference between overhead thinking and underneath thinking than the reasons men advance when they go into the front office to ask for a raise," Dean Donham continued. "A man will say: "I have been here so many years, and I think I should be doing better,' or 'My family has increased and I need more to live on,' or, 'You are paying Jones so much more to live on,' or, 'You are paying Jones so much a week more, and I don't see why I am not raised, too.'

"All of this may appeal to the boss's sympathy but not to his business sense. His mind is concerned chiefly with the problem of profits. It has to be so concerned. The reason for a raise, or for a change, that is sure to appeal to him is that this man has done something that makes him more worth while in the business.

"To read some of the articles written about business you would conclude that it is some sort of algebraic problem; that, given a few formulae and rules, anyone can go out and make two dollars grow where only one grew before. A good deal of our business training in the past has been predicated on that idea, ignoring the human factors entirely.

"Rules a man must have, if he is to play the business game successfully. But all the rules in the world will not make him win unless he knows how to use them and can figure out how the other fellow is likely to think and act. What are his motives and his interests? Who are his friends? Where do his profits come from? The search for and discovery of the motives of the other side in a trade or a negotiation is one of the first essentials to success.

"If you were starting in business again, where would you start?" I asked Dean Donham. "Does it make any difference where a man begins?"

"It makes a lot of difference," he replied positively. "There are some departments that seldom lead anywhere; and there are other departments that make the transition to executive opportunity much easier. Certain jobs seem to lead ahead into executive positions. Perhaps it is because they bring a man into contact with several executives; perhaps the chief is interested in a particular job because it is close to where the money is made; perhaps a certain job gives training in or familiarity with all departments of the business.

"On the other hand many jobs seem to be dead ends. When a young man is in such a job he should study how he may get out into another field. This calls for great skill and care. If tried in the wrong way, the chief is very likely to conclude that the man is a quitter and cannot stand the gaff. His staying powers may be on trial. The corporation is not run for the benefit of a single individual, and there may be no other job available at the moment. Nevertheless, skillfully done, a request for a transfer under such circumstances may become evidence of reasonable ambition and of the kind of quality that the chief is always looking for.

Ability to Analyze Valuable

"Patient, careful study of the business, of the organization, and particularly of the chief, should precede such a request. Before trying for a transfer at all, be sure that the job is a dead end. The man who can see new chances for improvement in a job of routine nature, and who realizes that, broadly speaking, no human process will stand the test of intelligent study without improvement, can make an opportunity out of many a job which is apparently dead and uninteresting. This is, after all, the best basis for obtaining a transfer—or, rather, a promotion—to other work.

"Before you apply for a job, analyze the business and the organization as well as you can from the outside, and make up your mind whether you want to apply to that particular concern or not. If you apply, don't attempt to dictate terms. After you go with a company, study it and yourself to see how you will fit best and what end of the business you want to get into. Plan ahead. Among other things find what end of the business is the one where the money is made, or the one that is most important in that particular industry.

"In most branches of the textile industry, for example, the money in ordinary times is made or lost in the purchasing and in the choice of what shall be made, rather than in the manufacturing. To get raw materials at the right time and at the right price is one of the principal problems; and the man whose judgment and knowledge enables him to know when, how, and how much to buy, and what can be sold, is worth any amount the concern has to pay to keep him. In a machine shop or a concern manufacturing

(Continued on page 160)

A Saw for Economy and Production

Straight Edging and Jointing Saw Is Cutting Costs in Many Plants — Increased Output and Saving in Stock Some of the Advantages—Has Wide Range of Usefulness

By G. A. WEBB.

Ripping stock so straight and accurately that the pieces may be glued without further straightening or correcting may seem to some like a stretch of the imagination, yet it is being accomplished day in and day out in many plants in Canada. The machine responsible for this fine work is the straight edging and jointing saw or, as it is sometimes called, the chain feed rip saw. This saw is a development of and an improvement over the older type of power feed rip saw and the chain feed band rip saw. While a comparatively new machine, it has earned a reputation for accuracy and production and is meeting with approval wherever installed.

To one who has never seen a straight-edging saw in operation or has not had an opportunity of testing the accuracy of the cut, a brief outline of the principles involved may be of interest. The saw is made in two shapes, one with the saw arbor mounted beneath the table, as in the ordinary run of saws, and the other with the saw mounted overhead, the work passing between saw and table. In both types of machine, the stock is held securely between a travelling feed chain, in the case of the machine with the saw coming up through the table two travelling feed chains, and a number of overhead feed rolls. The chain or chains are so secured and guided that the line of travel is a straight line one and absolutely parallel with the saw. The rolls and chains are so designed and adjusted that the stock does not swing around or twist as it is fed through. Thus it produces an absolute straight line cut without the use of any gauge or guide. Once started through at any angle, the piece holds that position till the cut is finished. The straight edge thus produced may be used for ripping to width from the gauge.

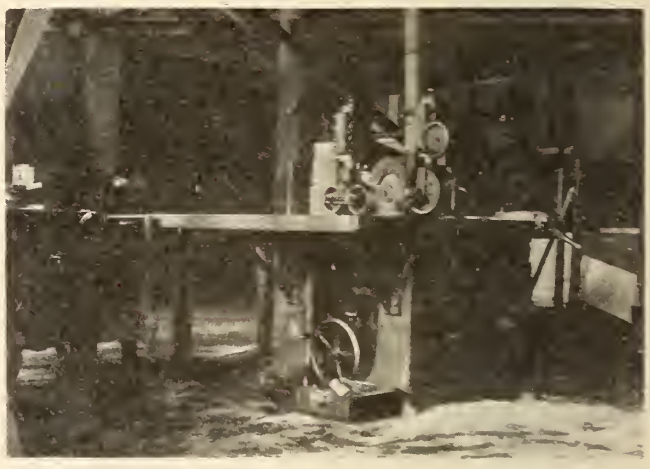
Save Considerable Stock

By properly selecting the cuts, pieces having crooked, tapered or wany edges, and stock containing knots, rotten spots or any defects, may be made to yield a maximum of usable material. The arrangement of chains and rollers is such that short and narrow pieces may be ripped or edged and worked up. Thus the machine can be put to many uses in addition to ordinary ripping and edging.

When first placed on the market it was looked upon as more or less of a special machine. While to a practical man the advantages of straight line ripping were apparent, yet the statement that the stock could be glued without straightening or jointing, was received with a certain amount of scepticism and usually with a mental reservation to the effect that such a saw would only be suitable for the very lightest forms of work. In other words, the possibilities of the machine were not at once recognized. Since then it has won its place as a piece of production equipment and today is found in the breaking-out department of many large plants. The writer has visited several plants which are operating two of these machines in their breaking-out section, and there are at least two Canadian factories which have installed a battery of six or more of these saws. As a rule, a straight edging saw will do as much work as three ordinary hand-feed saws. The saving in labor costs resulting is apparent.

Opinion of Practical Men

It might be of interest to review the opinions of a couple of practical men. The superintendent of a large furniture factory has this to say:—We have two of these modern straight edging and jointing saws and are particularly well pleased with them, as we



Straight-edging and jointing saw in Kitchener furniture factory

get wonderful results. When we first installed these saws, we had six hand rippers and one old type self-feed ripsaw. We put out all these machines and we get the work done just the same with the two straight edging and jointing saws. We also save a great deal in stock, as with the old type of machine we allowed ¼-inch oversize and with the new machine we allow only 1/8-inch oversize. The stock is always straight, and I think I am safe in saying that this machine has paid for itself each year. I certainly would not like to run a woodworking plant without one."

Another man in charge of a piano factory expressed himself as follows:—"It not only takes the place of the two saws formerly used but more work is put through in the day's run. The cuts are so true and accurate that for our heavy core work, the stock is glued just as it leaves the saw. The men in the gluing department claim that a jointer made in this machine is more accurate than one made in the ordinary jointer. For face stock where a fine glue line is required, owing to the accuracy of the cut, it is only necessary to remove a very light shaving on the jointer, effecting a saving in time and stock. Another desirable feature is the safety one, the operator being fully protected.

How Savings are Effected

The saving of stock referred to by the furniture factory superintendent is worthy of more extended mention. It stands to reason that with absolutely straight line cutting there is no need for allowing ½-inch or 3/8-inch for straightening purposes. When this allowance is cut down to 1/8-inch, the saving in

stock may seem to be small, but at a feed of only 60-feet a minute, the saving would amount to 40 or 50 feet a day or about 1200 feet a month, no small item in itself. In the case of core stock, which is usually glued right from the saw, the amount saved would be even greater for the 1/8-inch allowance would be done away with. For a faster rate of feed the amount of stock saved would be greater. Feed speeds as high as 125 feet a minute may be carried.

The usefulness of this machine is not confined to furniture work. It has a place in every plant where accuracy and production are considerations. In one factory 2-inch maple is being ripped at the rate of 75 feet a minute, while in another 4-inch birch has been put through at 50 feet a minute. The straight edging and jointer saw has certain limitations, however, for it is not probable that a straight line cut would be made on a long plank, although if a suitable extension or sub-table were provided, exceptionally good ripping could be accomplished even on long stock. As an all-round machine, it is hard to better and for the accurate ripping and edging of short lengths, 8 feet and under, it is in a class by itself and in addition it is a production machine of no small merit.

Is Your Belt Sanding Up-to-date?

Making Good Furniture at Low Prices Requires Efficient Methods—Belt Sanding Takes Place of Costly Hand-work on Large Variety of Intricate, as well as Ordinary Jobs —Select Type Which Gives Greatest Return in Labor Savings

By HENRY ADDISON*

Sanding by belt in the furniture factory dates back a good many years, but it is only within the recent past that belt sanding has been given serious consideration by practically every factory superintendent. This is due to the fact that economical production in any factory demands that all hand work which can be done easier, better and faster by power, must be eliminated in favor of the machine method. Any factory making furniture, cabinets, interior trim, store fixtures or mill work is not thoroughly up to date, if it lacks a hand-block belt sander.

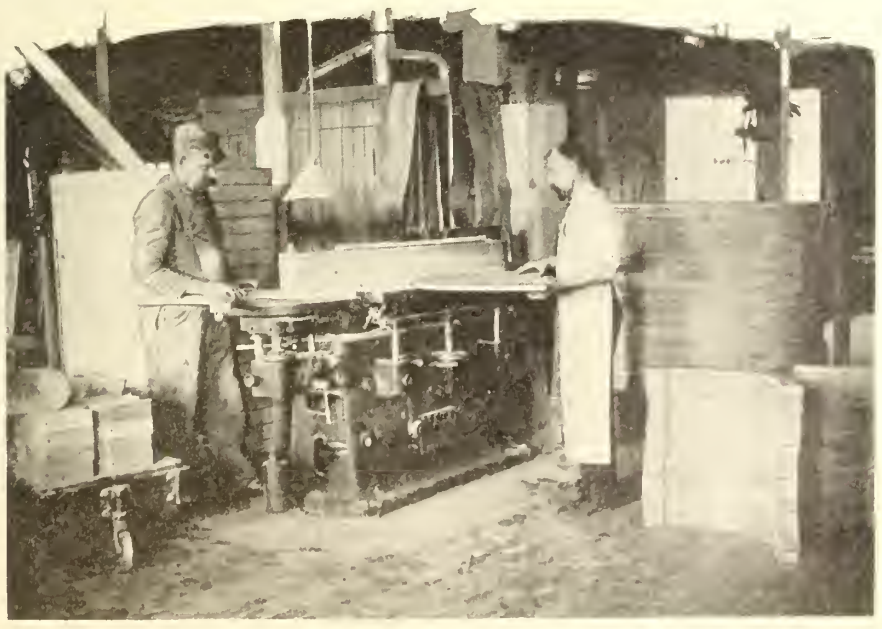
The reason is a simple one. Hand-sanding is expensive, slow, and liable to be slighted. But many firms have never taken the time to check up the number of small jobs, so-called, which are being sanded by hand, either partially or completely, by the cabinet makers. A survey of the mouldings, frames, and other similar jobs which are constantly being hand-sanded, would show conclusively that at least 75% to 90% of that hand work could be eliminated by the installation of a hand-block sander.

*Rockford Machine Works, Rockford, Ill.

Special Forms and Supports

Special purpose machines are a necessity, but as a general thing, they leave more or less touching-up to be done by hand. The adjustable table on the hand-block type of belt sander, and the flexibility of the sandbelt are two very important features. Table construction permits attaching special work-supporting devices for getting at the out-of-the-ordinary shapes such as large doors, round table tops, rods or poles, special moulded shapes, etc. almost without number. Truly the handblock belt sander is the all-around sanding machine. Its range is great enough to enable it to help out the special purpose machines when they are crowded with work, but its greatest advantage lies in its ability to eliminate the costly handwork on the ever-recurring small, odd jobs which every woodworking factory has to contend with.

There are numerous types of belt sanders on the



Performing various sanding operations on edge, belt sander in Canadian furniture plant

market adapted for special classes of sanding, and some of them are capable of producing a finish so perfect in smoothness that to further touch it by hand would spoil it. Take the automatic power stroke stroke sander which also combines hand-controlled contact—many concerns can afford to throw away old-style sanding equipment and buy this new automatic stroke sander, because it not only increases capacity, but gives that "perfect" finish which every finishing foreman has so long wished for. There are upright belt sanders, edge belt sanders, variety belt sanders, etc., each adapted to a particular class of finishing work, and it is advisable when figuring on sanding equipment, to get data from every possible source, to be sure of selecting the equipment which will return the most in labor savings, as well as insure minimum upkeep expense.

The oscillating belt edge sander is capable of a wide range of work, in addition to sanding plain edge. It comes in very handy for finishing square and octagon turnings which have been shaped on the automatic shaping lathe. In fact, any factory using this automatic lathe for square work, should not be without the oscillating-belt edge sander.

How Leaders Bring Down Costs

There are many small irregular shapes constantly passing through the factory which must be carefully sanded to prepare them for proper finish. They represent a class of work for which the variety sanders are well adapted. Legs of the Queen Anne style are most economically handled on such a machine.

In this day of sharpest competition and lower selling prices, it is necessary to utilize every mechanical device obtainable which will lessen the amount of costly labor entering the make-up of wood products.

The recent furniture markets have indicated what the leaders in the industry are doing along that line. Many quality lines sold at figures so low that a lot of other manufacturers can't seem to figure out where the producers get off without a loss. Well, they know prices must come down, and quality must go up. They have discovered it is possible to make good furniture at a reasonably low price, if there is no lost motion in the factory, and labor costs are kept at a minimum by providing each worker with the most efficient tools and machines to be obtained.

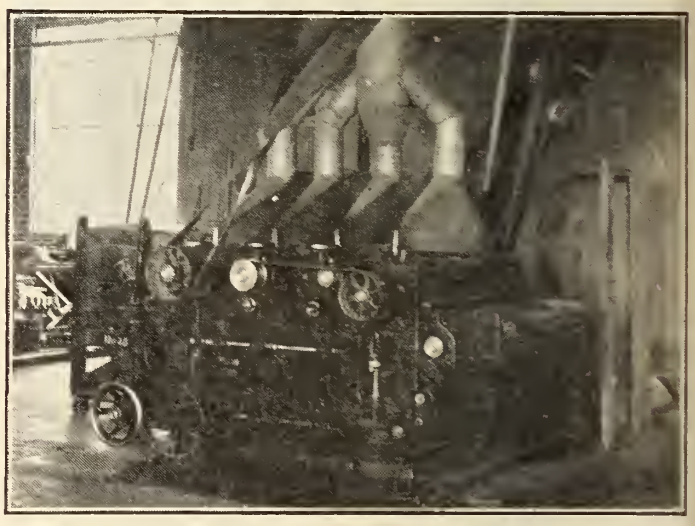
The Care of Three Drum Sanders

Generally speaking a three drum-sander is a much abused piece of machinery. It is expected to turn out a high grade of work, and in return receives as little thought and care as will keep it running. The designers of the three-drum sander, designed this machine to remove the grain and leave a smooth finish on work that had already been surfaced; but in many cases it is expected to do the wok of the planer, in addition to producing a fine finish.

The condition of the felt coverings on the drums plays an important part, not alone in the finish produced but in the life of garnet paper. There is no question regarding the economy of using felt, yet every now and then one will come across a firm which has substituted brussels carpet. When the carpet is first put on the roll or drums it makes an exceedingly good covering, but in a very short time it mats down and becomes hard..

The care of felts is something that receives too little thought. Very little attention will give surprisingly large returns, not alone in the saving of garnet paper but in the quality of finish turned out. The felts should be brushed with a good quality bristle brush each time the papers are changed. The best brush for this purpose is along the lines of the one used for currying a horse. A fibre brush or floor broom should never be used upon a felt. The reason for brushing is to remove the fine, dirty particles which gather and to keep them soft so that they will retain their resiliency. It is very important to use great care in keeping oil off the felt as a few drops of oil will gather and retain dust, and eventually form a hard spot which will make holes in the paper and will show on the finished work.

There is no standard or rule governing the grits of paper used on the different rolls. We often find operators producing good results with what seem almost impossible papers. The designers of the three-drum sander intended the first roll to do the cutting and the grit of this paper should be determined by the condition of the work when received by the sander. The second roll is designed to remove the scratches left by the first roll, and this paper should be only



Three drum sander in plant of Langslow Limited, Cobourg, Ont.

course enough to do the work which it was intended. The office of the third roll is to remove the scratches left by the second roll and give the final finish.

The selection of the paper for the third roll must be governed by the treatment the material is to receive and by the finish desired. If the work is to go to a belt sander after going through the three-drum sander, it will be found that most satisfactory results will be obtained as here the third or fine roll of the three-drum sander may be covered with number one half-paper. The reason for this is that all three-drum sanders press down the grain and leave a polish. The finer the paper used, the more pronounced the polish, so that where No. 00 paper is used on the drum, the man on the belt sander is obliged to go over the coarse paper to roughen it up before he can produce the finish required of him. Therefore, it has been proven that by using a coarser paper on the finish roll of the three-drum sander, the belt sander will turn out more and better work.

Combining Operations to Reduce Costs

Various Combinations of Operations May be Preformed on Double-end Tenoner

BY H. A. RALPHE

Furniture manufacturers may be divided into two classes, those who have double-end tenoners and those who would like to have them. Most of those in the latter class appreciate the efficiency and productiveness of the machine but are unable to see where they would have sufficient work to keep it going. It is true that to realize the fullest possible return from an investment in equipment, there should capacity every hour the plant is running. It is also true that a machine may be so efficient, so versatile be enough work coming along to keep it operating to and so productive that even though it is possible to keep it in operation only 50 per cent of the time, it would pay a sufficient return on the money tied up to warrant the investment. Such a machine is the double-end tenoner, which is in reality a double-end tenoner and double-end cut-off saw combined.

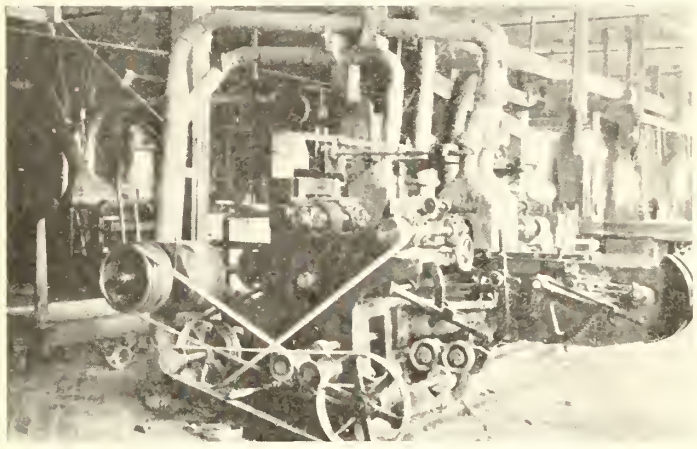
This may seem like a strange statement, but I venture to say that any plant worthy the name of furniture factory, would find a double-end tenoner a profitable investment. Doubtless exception will be taken to this assertion, but a brief outline of the field of usefulness of the machine will tend to confirm this stand. Just stop and think for a moment. The double-end tenoner will tenon, cope, trim to length, dado, end-groove or rabbet both ends of the material being fed through. This in itself eliminates one cut, for in any type of single-end machine, either saw or tenoner, the work must be turned end for end and a second cut made. More than that, many of these operations may be worked in various combinations, reducing the number of handlings and the cost of manufacturing still further.

How Operations May be Combined

The writer was in a plant not long ago and saw them trimming both ends of some stock and cutting a shallow rabbet at the same time. The set-up was simple. Saws the same thickness as the width of the rabbet but smaller in diameter were placed on the spindle with the dimensioning saws and then set for depth. Without this machine the pieces would have

View in Owen Sound furniture plant. Note boxes to catch end waste

been cut to length first and then each end rabbeted on either single-end tenoner or saw table. When one looks at the machine in this light and then considers how other operations may be combined, such as trim, tenon and cope, trim rabbet and dado, trim end-groove and dado, etc., and that different operations or different combinations of operations may be performed on the two ends of the stock at one time, it



Double end tenoner set to work stock 9" long

is then that the many advantages and full possibilities of the machine are realized.

The feeder is a continuous chain one, there being no drawback to the work. The capacity of the feed and of the machine itself is in excess of the ability of the operator to handle the stock. On certain classes of work several pieces may be placed in front of each stop, thus increasing the output many times. For wide stock, material up to 28 inches may be worked on the average machine, one or more stops are removed from the feed chain and the pieces sent through. This means that tops of tables and dressers, etc., may be accurately trimmed to length at a good rate.

Output Depends on Operator

It is difficult to give a comparative idea of capacity of the double-end machine, for it depends entirely on the type of work going through and on the willingness of the operator to hump himself. It is claimed that one double-end tenoner will turn out as much work as from three to six single-end machines, or about the same number of cut-off saws. It is a combination double-end tenoner and double cut-off saw of large capacity.

The amount of work put through often comes as a surprise to even those operating these machines. One manufacturer of kitchen cabinets came puffing into his office one day recently and exclaimed "I never saw the like of this double-end tenoner. I have just put through as much work in three-quarters of an hour as would have taken me three days working with old equipment and old methods. It certainly keeps a man hustling to keep up with it." A Hanover manufacturer relates how he dimensioned side rails for beds by picking up an armful at a time and laying them on the chain, letting the stops carry through as many as they could. In the hands of a practtical operator who is not afraid of using his head and figuring how diffedent combinations may be worked, there is almost no limit to the kinds of work that may be handled.

What's Your Opinion of Double Miter Saw

Proving Its Value as Production Machine in Many Furniture Plants—Wide Variety of Work May be Handled—Usefulness Not Confined to Miter Work

BY J. R. TRACEY

One type of machine that is coming widely into use in the manufacture of furniture is the double miter saw. This machine, is generally so constructed that it is equally well adapted to square work and to work with all kinds of simple and compound angles. The ability to handle square work as well as miter work permits its use in the smaller factories where they only feel able to install one double cutoff saw.

The gain in efficiency, both in saving of labor and in accuracy of the work by cutting angled work both

Automatic type double miter saw. Table automatically raises and lowers

ends at once, is easily understood. Where both ends of a piece of work are cut simultaneously the work is bound to be cut with the angles in the right relation to each other and the work to be accurate in length. This is true even if the work gauge should vary. The saws being positioned the work is bound to be of the right length and angle.

More Than One Piece Handled

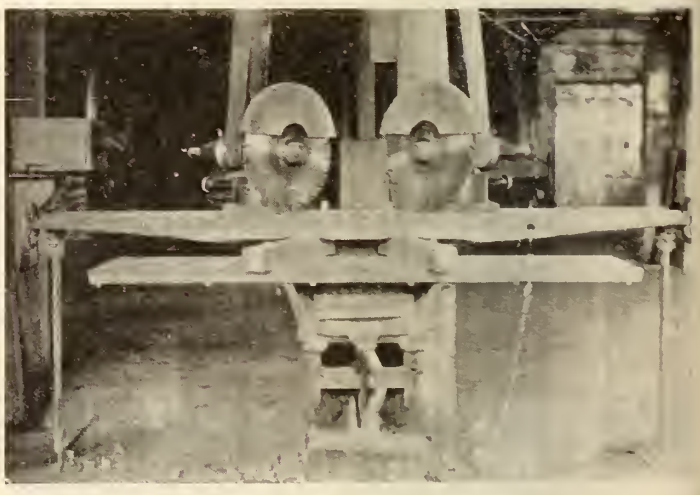
On all work that is square or with simple angles it has been found practicable to cut several pieces at a time. In one factory a record was made of cutting four thousand pieces of work in one hour, the work being about 7 inches wide and ⅝ inch thick and cut on the ends on an angle of about 17½ degrees. This was done by cutting the work six and seven pieces at a time, one man feeding the machine and another man taking the stock away.

In cutting compound angles, such as the domes of phonograph cabinets, casket parts, and similar work, it is only possible to cut both ends of one piece at a time. In cutting this stock, after the saws are positioned at the proper angle, it is leaned toward or away from the operator to give the proper compound. In fact, compound angled work is placed on the machine in exactly the same position that it occupies in the finished work, thus a casket side or end is cut nearly upright, leaning slightly back towards the operator, the amount of incline conforming to the flare of the casket.

Dadoing, Grooving and Even Tenoning

Double miter saws are also generally made so that the arbors will carry dado heads as well as saws, thus making the machine suitable for many kinds of dado and grooving work. It is also possible, by using saws along side of the dado heads, to dado the work and trim to equal lengths at one operation. As double miter saws are made with tables that travel up and down, grooving and dado work are cut with the work standing up on edge and carried in this position past the center of the front of the saws. In the same way, by swivelling the saws to an angle of ninety degrees, the work can be grooved in the ends and the machine used in some cases as a double end tenoner. Another advantage that the machine has is that any work can or square. Moreover, after the first cut is made each succeeding stroke of the table will produce two pieces. easily be cut into short lengths either plain, mitered,

In furniture work there are many uses for a saw of this kind. One Ontario manufacturer of extension tables, trims all his semi-circular rims on a double-miter saw. He swings the two heads around so that the saws are in line, and by using a large wood sub-table, fitted with adjustable stops, finds that this work can be handled to good advantage. Not only is it quicker than the old method, but is more accurate as there is no chance for any variation in the cuts made. This also holds true of rims for small oval tables; in fact for oval tables of any size. Each saw can be set



Double miter saw with treadle for raising table

at varying angles so that the different bevels on rim stock for oval tables can be cut at once. It is not difficult to set a number of stops to secure the sizes desired.

The ease with which the double mitre cut-off saw may be set up for different cuts is a very desirable feature. Elaborate forms and stops are not needed for the simpler kinds of angle-cutting. Practically all work is handled on edge. The saw heads are swung around to make the required angle and then adjusted for length. This leaves nothing but the fence and stop, or stops, to look after. In some types of machines, the up and down motion of the table is an automatic one. All the operator is required to do is lay the piece in place and remove it after the cut has been made. In a simpler design of machine, though

(Continued on page 160)

Upholstering and Trimming

The New Era in Upholstering

Tendency Toward Smaller and Daintier Upholstered Furniture—Canadian Upholsterers Should Create Not Imitate.

By W. O. Mendell

Strange indeed would it have been if the great world war, which left its indelible marks on every industry in the world and made such wonderful changes in every sphere of science, had passed the art of upholstery unnoticed. The contact of our men with the quaint old furniture in Northern France, Belgium and Italy, has brought a revival of the picturesque, the fine outlined, the dainty and the exquisitely carved furniture of the days of the old Venetian and Florentine masters and the years when a Chippendale, a Sheraton or a Hepplewhite swayed the designs and the texture of the English craft. These men evolved out of the heavy and somewhat clumsy, but eminently substantial, Dutch furniture the graceful and charming, the straight, structural and the elaborate but very practical furniture, full of beauty which has made their names immortal in the history of the woodcraft. Not only was their name heralded as master workmen but in their day the art of upholstering was given an impetus that with ever increasing grandeur and possibilities has reached until the present hour.

Truly kaleidescopic have been the changes that have taken place in the materials as coverings; now crude and almost vulgar, then again quiet and subdued, now classic in its outline and color and then again like the fantasie of the master musician breaking forth in a brilliance and daring of execution that dazzles the eye and keeps us spellbound with wonder and admiration.

To Much Stress on Size

From the brilliant parti-colored embroideries and brocades with their offerings of fruits and foliage, and flowers of the Jacobean period, ever increasing in brightness and masterfulness through the days of the petitpoint and grosspoint work of the years of William and Mary and Queen Anne until it reached its climax in the luxurious extravagances of a Louis XVI, when the finest brocades, Indian damask and velvets with its pastoral scenery were used to satisfy the ones whose circumstances allowed them to spend a small fortune upon upholstered furniture, leaving the great masses of people with the rough, uncouth and uncomfortable furniture of their day.

Then like a star came the influence of the American continent in the introduction of machinery and power in the industry of weaving, which took the upholstered furniture and brought it within the reach of the majority. But alas, in the evolution much of the daintiness was lost and there rose among us the furniture that was bought, not for its outline of grade and charm, but for its size, not for its undying spirit but rather for its amount of material. Inches was the standard by which every piece was measured, and there was a veritable rivalry among the manufacturers to outdo the other in size until our furniture became unwieldly and bombastic, gaudy and freakish. We are, however, on the threshold of a new era.

The Clumsy and Ugly Must Go

The verdict has gone forth. The clumsy and ugly must go and there comes a far-off cry, increasing in intensity, from the great majority whose housespace is limited and whose expenditure must be carefully balanced with their income, for low-priced upholstered furniture which does not offend the taste and in which at least an effort is put forth to return to the gracefulness of the periods. Something simple for the living room or the den and yet comfortable and at a price the people who are but common folk can satisfy their longing. The frames may not be of the elaborate design of the Napoleonic period, but it must possess some of the austere simplicity of the Dutch tempered by the gracefulness of a Hepplewhite or a Sheraton. The covering may be inexpensive but there is no reason why its coloring should not be dainty.

The future is before us. May we be able, out of the glorious past of upholstery, to evolve a still more magnificent enduring future, for let us remember that in every human heart there is a deeply imbedded hunger for the graceful and the harmony of color and of which much is lost in the great struggle of life. Let us as Canadians not be merely satisfied to follow on and be imitators of our neighbors, but as the fathers of the country hewed out of the dense forest the magnificent inheritance they have left us, so let us blaze the trail so that the upholstery of Canada may be noted for its noble design, its sturdiness of quality, its beauty of outline and its homey appearance that invites not only the admiration of the eye but gives the satisfaction of comfort when the toil of the day is done.

Bulletin on Cutter Head Grinding

A bulletin on grinding cutter heads, showing how fast feeds, constant operation and large production, insuring a greater margin of profit in addition to increasing capacity for handling a larger output are possible, is now ready for distribution to the trade of the S. A. Woods Machine Company, Boston, Mass.

This bulletin is illustrated and shows clearly how to do a number of things on a cutter head grinder that are not understood by all millmen—such as grinding clearance bevel on ordinary carbon knives while in place in the standard square head; grinding thin high-speed knives in place in the round head; grinding the cutting or so-called back bevel used for hardwood planing on the ordinary carbon knives in the standard square head, etc.

This illustrated bulletin, free for the asking, shows how to eliminate lost time in the mill and grinding room, improve the finish, minimize manufacturing costs and simplify the work of the men in the mill.

Packing Upholstering For Shipment

Appearance Often Marred Due to Faulty Packing—Stuffing Seldom Comes Back if Compressed for Any Length of Time -- Points Which Require Special Attention

To the practical upholsterer, furniture which is made on the K. D. principle is usually associated with unfinished work, such as backs partially tacked to allow for bolts, arms that must be left open at certain parts to allow for screwing, and under-seat coverings temporarily tacked. These and other such technical details have to be studied in order that the various parts when assembled permanently will have none of the appearance of K.D. work, Says F. Palmer in the "Cabinet Maker." There is a great demand for this type of upholstery abroad, but unless it is carefully handled both in packing and assembling at its destination it rarely presents so smart an appearance as upholstery not built on the K.D. principle. The finished job not infrequently shows some outward sign, more or less pronounced, such as visible screws or bolts, that the frames are made for taking apart. There is no need for this, and the field for improvements in the manufacture of K.D. frames as well as in the upholstery is a wide one.

Points to be Watched

It is highly important that more than ordinary care should be exercised in upholstered work for shipping, as complaints are difficult to deal with at such great distances. It is generally the stuffing or covering material that becomes damaged in transit, and therefore special attention should be given not only to the workmanship but to the packing of the goods when finished. Fig. 1 is lettered to show those parts of a of a stuffover easy chair which are likely to become unsightly when compressed for a long period, or jammed into a packing case which is too small to take it. It is more essential that ample packing material is given at these parts, which in addition, should be protected by outside slats. In this way the appearance of the chair is preserved, and the possibility of complaints much reduced.

There are many devices on the market for K.D. chairs, but nearly all are based on the same principle. For export purposes it is necessary to get the greatest number of chairs into the least possible space, and to ensure this the chair-back must be made detachable. This is probably the source of the greatest weakness in K.D. stuff, for however, the joints may have been it is obvious that the various parts cannot be assembled quite so successfully after the work has been upholstered as when in the frame stage. The tenons or dowels must be glued; this involves the use of cramps, and thus there is always a danger of the covering material being damaged by tools or rough handling, and of the stuffed edges, which are of such importance to the appearance of good work, being forced out of shape. The need appears to be for backs made on the telescopic or folding principle, which would allow of the upholstery being completed, and do away with the use of glue cramps when the work is assembled.

K.D. suite frames often present difficulties to the upholsterer who, unless he happenes to be an expert and knows exactly how to manipulate the stuffing to the best advantage, is apt to waste much time in putting the work together and taking it apart again There is also room for experiments with chairs made of such dimensions as to fit together when packed without displacing the upholstery. For instance, three-piece suites might be so designed and the length of the settee so adjusted, as to allow of the pieces being packed together in a small amount of space.

Should be Packed Separately

Large stuffovers are usually made on rigid frames, and the ample room afforded by the seats is regaded as a safe place for depositing breakable goods or small parcels that require careful storing. Stuffover seats are frequently damaged in this way. The packer will force packages between the seats, arms or hollow of the back just because the stuffing will give, and makes a tight fit possible. This does the upholstery no good, and is very likely to damage or stretch the covering material. An ugly fullness and saggy appearance is caused by long compression of the stuffing, and this is a frequent cause of complaint. Compared with the cabinet maker the upholsterer is at a disadvantage in making work for export, unless it is most carefully packed. The fine lines of the upholstery are soon marred by rough handling, careless or unskilful packing with other goods, or by the covering material becoming slack owing to long compression.

Although it is true that cabinet work may be spoilt by breakage or the polish straw-marked or scratched in transit, the packer cannot take the same liberties with case goods as he does with upholstery. Stuffover upholstery needs extreme care in handling and packing if it is to be presentable when it reaches its destination. Everything depends on the contour, and if the stuffing is compressed unequally or the projecting parts of other goods are allowed to impinge on the stuffing, the impressions made sometimes become permanent, and the original shape of the upholstery cannot be restored.

When a variety of goods is to be packed in a single case the packer naturally aims at fitting them together conveniently without any superfluous space between them, and thus endeavours to avoid the need for wads and cramming. Unfortunately, little consideration is given to the fact that stuffed goods are more liable to damage in this connection than cabinet work It is too generally assumed that the upholstery can be forced into position in the case, but when this in donc damage frequently results.

Poor Packing Expensive

The writer hopes he will be forgiven for dealing so hardly with packers, but a long experience of shipping work in all stages has convinced him that many complaints of faultly workmanship in the upholstery when investigated can usually be traced to inadequate methods in packing.

At Fig. 2, a stuffover arm is shown. When unpacked such an arm not infrequently appears as shown at Fig. 3, and unless it receives some technical attention at once it seldom regains its original shape. Buttoned work, see Fig.4, calls for special care, otherwise the appearance is very ugly owing to the fulness given to the material. This style of upholstery should

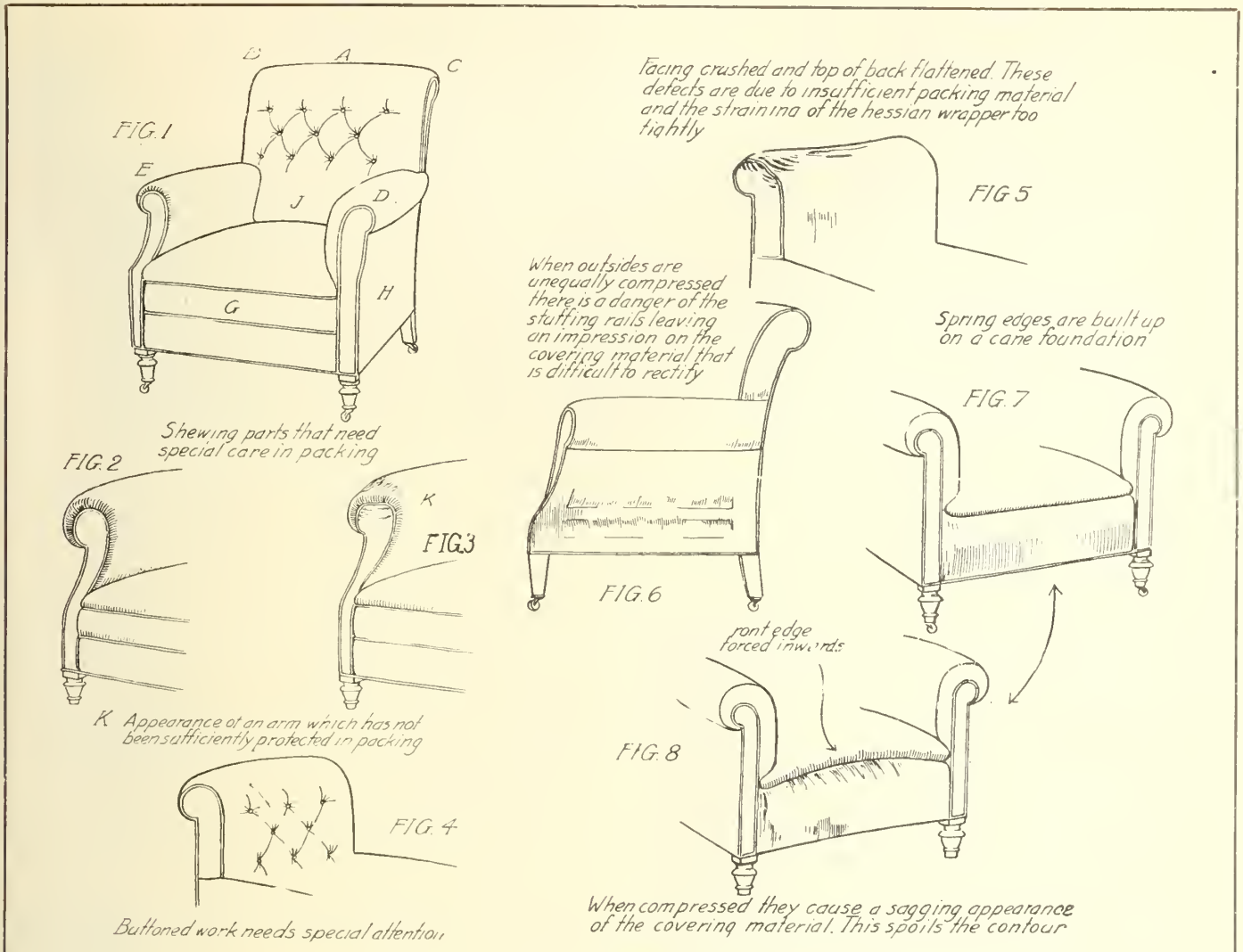


FIG. 1
B
A
C
E
J
D
G
H
Shewing parts that need special care in packing
FIG. 2
K
FIG. 3
K Appearance of an arm which has not been sufficiently protected in packing
FIG. 4
Buttoned work needs special attention
Facing crushed and top of back flattened. These defects are due to insufficient packing material and the straining of the hessian wrapper too tightly
FIG. 5
When outsides are unequally compressed there is a danger of the stuffing rails leaving an impression on the covering material that is difficult to rectify
FIG. 6
Spring edges are built up on a cane foundation
FIG. 7
front edge forced inwards
FIG. 8
When compressed they cause a sagging appearance of the covering material. This spoils the contour

Illustrating how furniture is damaged through faulty packing

be kept free from any heavy pressure such as the backs or legs of chairs placed in the seat to economize space. The damage which is liable to occur to outside arms and backs is indicated at Fig. 6. When pressue occurs through careless packing the line of the tacking rail shows distinctly through the outside covering. In this connection it may be remarked that upholsterers frequently neglect to place a little padding on the stuffing rails.

Upholstering work with spring edges also needs careful packing, otherwise the edge tends to fall inwards and ruins the appearance of the seat. The front of this style of work should be well padded and always protected with outside slats so that the compression is equal on the whole surface. Nothing but entirely removing the front will restore a spring edge seat damaged as indicated at Fig. 8.

Care of Electric Motors

Motors, generators, or any form of electrical machinery should always be fixed to a solid foundation, for preference a solid concrete bed prepared expressly to receive it, and not, as one so often sees it done in sawmills and factories, simply belted down to a wood floor, a couple of joists, or even a single plank.

In cases where motors require to be fixed on an upper floor, or on a wall bracket or similar structure, every endeavor should be made to obtain as far as possible a solid, rigid, vibrationless bearing. Many breakdowns can be traced to unsteady foundations, this being particularly the case in direct-current machines, where sparking and chattering of the brushes has been the result.

Generally, motor bearings are of the ring-oiled type—efficient enough while in order, but always liable to give trouble if neglected. The ring may become slightly damaged, it may lose its concentricity, wear into a flat place, become distorted. This stops its functioning, it ceases to bring up oil from the well to the journal; heating occurs, and the destruction of the bearing is not a long way ahead.

As a result of the oil being repeatedly used, as it is in this type of bearing, it is very liable to oxidise, to become gummy, to hold in suspension dirt and dust; in time it may become so thick as to hold the ring. The remedy is occasionally to empty the oil well, wash out the interior with paraffin, and to refill it with clean, fresh oil.

Beware of over-filling the oil chamber of a ring-oiled bearing. The practice of adding a small quantity of oil every time a motor is started up is not only unnecessary, but wasteful. Over-filling means a messy bearing, which collects dirt and dust; it may also mean the escape of oil along the shaft and on to the windings of the motor, where it may do no end of harm.

The
ORIENTAL TEXTILES COMPANY
LIMITED
Oshawa, Ontario

Manufacturers of
Upholstery
Mohair
and Velours

Agent
J. H. ALLEN
33 MELINDA STREET
TORONTO

Getting the Most From the Trade Journal

by H. W. Strudley

Manager, Imperial Rattan Co., Limited, Stratford, Ont.

We have passed through what might be called a soft period of merchandising. From 1918 to 1920 all who had goods for sale could sell them at such prices as they chose to ask. The fall of 1920 began with a fall in demand for over-priced materials of all kinds. Here the law of supply and demand slipped in and the law of the survival of the fittest in business began to function. Liquidation is still in order and until it is completed, business will not be normal.

With the healthy reaction of competition again with us, it behooves the man of business to scrutinize his spending departments to cut out waste, to exact economical production and reductions in costs so that his products may be available for the reduced income of those who would buy his wares. It also behooves the manager of factories to be alert and anxious to please his customers with improved products, new ideas and better values. 6

Most every trade has a journal of particular interest to itself, and the management of these journals in self interest endeavors to make them interesting and instructive. They secure advertising from machinery and raw material supply people of special interest to trh trade served. I have found these journals of much interest and profit. Every machine or supply advertized is carefully scrutinized with the idea of improving our product. Every message from fellow-manufacturers is read carefully and, if applicable, passed on to the department interested. The journal gets to the waste-paper basket only after all "ideas" are used or absorbed, or because it has nothing to contribute to the efficiency of a plant. We believe a trade journal can be used to advantage in every plant and that its chief aim should be to pass on information from those who have products needed to those who need them with the "big idea" of serving the public by giving them the luxuries of life at the least possible cost commensurate with fair wages and fair return for capital invested.

Valuable Book on Costs

The National Association of Cost Accountants, New York, recently issued their year book for 1921. This is a very interesting and instructive volume of 400 pages and is one of the most valuable collections of cost material which has ever been brought together. Including in it is a full report of the second international cost conference held at Cleveland, Ohio, last September, together with papers and discussions on such interesting and practical subjects as"Interest As An Element in Cost;" "Cost System as a Means of Preventing Waste;" "Uniform Methods and Standardization Cost;" Distribution of Overhead under Abnormal Conditions," and "Executice Uses of a Cost System." Each of these subjects is covered by a number of papers prepared by men who are experts in their particular fields. A full report of the ensuing discussions is also included.

A copy of this book may be secured from the secretary, S. C. McLeod,130 West 42nd St., New York. The price is $3.00.

DOON (Entirely Made-in-Canada) TWINES

Write us to-day for prices and full information concerning any of the following: Furniture Twines, Spring Twines, Stitching Twines, Seaming Twines, Tufting Twines, Wrapping Twines, Flax, Hemp and Jute Twines for all purposes.

"Doon" Twines are entirely "Made in Canada"

DOON TWINES, LIMITED

Spinning Mills at Doon and Kitchener

HEAD OFFICE : KITCHENER, ONTARIO

D&P

CURLED HAIR GLUE SANDPAPER

DELANY & PETTIT LIMITED

TORONTO.

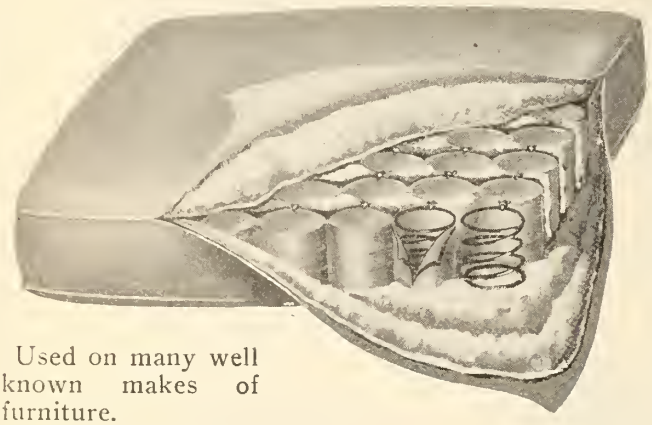
OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC

"COMFY" CUSHION COMPANY
Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.

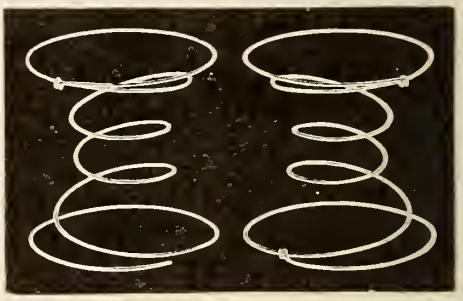


Used on many well known makes of furniture.

Write for Catalogue

"Comfy" Cushion Co.
340 Gerrard Street, East, TORONTO, Can.

"IDEAL"
FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,
of Canada, Limited
Windsor - Ontario

Subscribe for the
Canadian Woodworker
and
Furniture Manufacturer
Only $2.00 per year

E. T. CARTER & CO.

84 FRONT STREET EAST
TORONTO

Dealers in

Fibro Products, Linters, Reeds, Rattans, Waste.

Quality Guaranteed. Prompt Shipment

Eagle-Ottawa Leather Co.

TANNERS OF

FURNITURE LEATHER

OF EVERY DESCRIPTION

We are making a specialty of cutting

Spanish Split Leather for Chair Manufacturers

Quotations and samples furnished on application

We will be pleased to supply a very attractive sample book, of all our grades on application.

GRAND HAVEN - - - - - MICHIGAN

New Finishing Material Proving Popular

Recent Exhibitions Show Popularity of Lacquer Finish—Produces Wear and Heat Resisting Surface

By W. H. Dawson*

Styles in furniture, like modes of fashion, are constantly changing. How different are the finishes of today from those of yesterday? It is not so many years ago since the high polish furniture was "all the rage". Golden oak was a familiar example of such finishes. In those days, the more coats of finishing materials that a manufacturer could pile on his furniture—the better the finish was considered. The natural beauty of the grain of the wood was often entirely obscured. Then came a reversal of popular opinion. The public were tired of these glaring finishes and demanded something more subdued. The so-called rubbed or dull finishes partly satisfied this demand, but even these finishes were not yet just what was wanted.

Imported woods such as mahogany and circassian walnut became quite popular until the war conditions made these woods very scarce. Furniture manufacturers then began looking for another material to take the place of these imported woods, and of necessity turned to native oak and walnut. The value and beauty of these woods were recognized and our own woods began to come into their own. The manufacturers realized that the old finishes would not do, and what would be the new finish, was the all-important question.

Development of Lacquer Finish

It was just about this time that wood lacquer was perfected and this new material opened the way for new finishes. Furniture manufacturers have not been slow to take advantage of this new finishing material. The furniture exhibitions held recently at various centres gave an indication of how this material is taking. There was hardly a line on display which did not include one or more pieces in lacquer finish. This was particularly true of the American exhibition for there, it has been stated, that lacquer was the most popular finish on the market.

The latest development in finishes on oak and walnut, is known by various names. Some manufacturers call it the Italian or Italian Renaissance finish. Others call it Antique Oak, or Walnut, Dusty Walnut, etc. The finish was introduced six manths ago and has obtained an almost phenominal success. While colors and shades vary with different manufacturers, they may be described in general.

Italian Oak is a deep rich brown. It is filled with a dust-colored filler which gives the "dusty" appearance. Italian Walnut is also a "dusty" gray finish. Perhaps the most popular shade is a gray with a slight greenish cast. Other shades are blue gray or pearl gray. All are open pore finishes and semi-filled with the "dusty" filler mentioned. Wood lacquer has made these finishes possible. The Italian finishes can be produced at a lower expense than other finishes, with no sacrifice to quality or beauty.

Italian Walnut and Italian Oak Finishes

The accepted formula for producing the Italian Walnut finish was recently published in these columns but it may not be amiss to repeat it.

Italian Walnut

Sand wood smooth, and stain. To make the stain, take

Nigrosine Green Black ..... 1 Oz.
Warm Water ..... 1 Gal.

Where sap streaks exist in the wood, add ¼ oz. Crystal Sulphate of Iron to the formula. Dry thoroughly.

Spray on a coat of lacquer thinned 30% to 50%. Spray at 25 to 30 pounds pressure. One coat is sufficient but two coats may be applied if more body is desired. Let this dry for about four hours and sand smooth.

Now rub in a coat of wax, to which dry Zinc White has been added. Take 3 parts wax to 1 part Zinc White. Wipe off the excess wax to the desired tone. (Caution: the Zinc White mixture should only fill the slight open grain of the walnut.)

Italian Oak

Sand wood smooth, and stain. To make the stain, take

Italian Oak Stain Powder ..... 1 lb.
Water ..... 2 gal.

Flow the stain on the work, giving it plenty of time to penetrate, so that a deep rich brown color is secured. (If a lighter shade is wanted the stain may be reduced).

When thoroughly dry sand lightly and fill with a mixture of rottenstone, turpentine (or naptha) and a very small quantity of Japan as a binder. For quick work use benzol instead of turpentine, but care must be used in applying such a filler as it dries very rapidly and will have to be cleaned off at once.

Spray on a coat of lacquer, thinned 30% to 50%. Spray at 25 to 30 pounds pressure. One coat is sufficient but two coats may be applied if more body is desired. After drying for about four hours, sand and wax. Mix a little rottenstone with the wax or apply a coat of wax and sprinkle on a small quantity of rottenstone. Dust off and rub to desired polish.

It is difficult to describe the beauty of a wood lacquer finish. It hasa softness of tone and a velvety

*Celluloid Zapon Co., Wilmington, Dil.

richness that at once attracts and appeals to all who know fine finishes. The great transparency and toughness of the coating fulfills to a considerable extent, the dream of the finisher for a new finishing material.

The distinctive qualities of wood lacquer may be briefly summed up as follows:—It will not scratch readily nor show white marks. It is hard, durable, elastic and water proof. Hot dishes and steaming liquids cannot mar it. It will not "check", "craze," nor paper mark. It dries rapidly—(dust free in 15 to 20 minutes) and extremely level, consequently there is little material to rub out. No sanding between coats is necessary. These qualities point the way to a big saving of time in the finishing room as it is possible to apply several coats in one day.

These finishes are very popular seemingly having caught the eye and fancy of the furniture buyers. When the durability of lacquer as a finishing material once becomes established it will likely become more popular than ever.

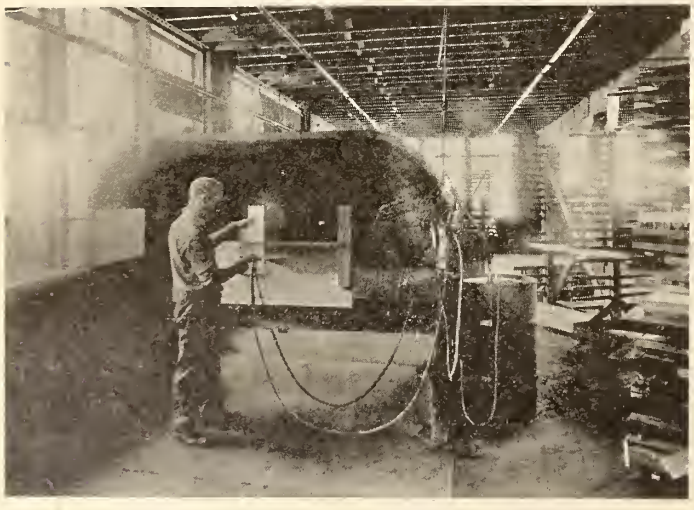
Are You Spraying Shellac, Stain or Filler?

Modern Method is to Apply all Finishing Material by Spray Equipment—Excellent Results Being Secured—Reduces Labor Costs and Increases Productiveness of Department

A Few Practical Suggestions

By Emil E. Frey*

This is a mechanical age. Shop-worn, laborious hand methods are replaced by the more efficient and modern ones. Those who have been slow in the adoption of these improved time and labor saving methods are handicapped in this period of downward prices. Competition is keener than it has been for years. Improvements in methods must come. All devices which are designed to maintain quality but reduce production costs must be given deeper and more serious consideration than ever before. The widest possible use must be made of those devices or methods at hand. This applies generally to all fields and especially to the furniture industry. What has been found essential in the cutting-out and fabricating of furniture is also essential in its finishing. The use of brushes in the finishing room is almost done away with. Applying any of the finishes by the brush method is as costly and as inefficient as the cutting or planing of wood by hand. The method of finishing furniture which has cut costs, increased production, improved finishes, saved space in the finishing room and placed it on an efficient more healthful basis is the mechanical application of stains, fillers, shellacs, varnishes, lacquers and enamels by air.



Applying stain by spray method

A spray-finishing equipment consists of a compressing outfit, an exhaust outfit, and the spray unit with its accessories. The size depending on class and nature of work. The compressing outfit consists of an air compressor of sufficient size to furnish the required number of cubic feet of free air per minute, air receiver and motive power. The exhaust outfit consists of finishing booth, in which the work is coated, and exhaust fans. The spray unit consists of material containers, hose, spray guns, air regulating and purifying means and dusters.

*DeVilbiss Mfg. Co., Toledo, Ohio.

Judging Most Suitable Pressure.

Stains, owing to their light consistency are applied with a small nozzle spray gun, the pressure required to atomize not being very high. Regardless of the material to be sprayed just enough pressure should be used to thoroughly atomize it, this may be 25 pounds in some cases while in others 80 pounds. The more viscous materials require the higher atomization pressure. Uniformity in application is the only caution necessary and can be easily accomplished when applying stains by spray. Even, rapid strokes, with the grains, making proper laps and starting and stopping the spray at the beginning and completion of each stroke will insure perfect results. It is essential to keep the spray properly lined up and adjusted for spraying all materials.

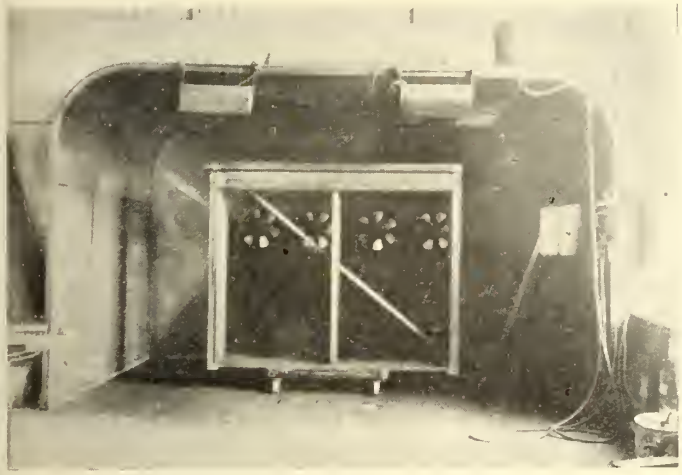
Filling of woodwork is the first important step or the foundation upon which the final finish depends. Improper or careless application and rubbing of filler is not considered serious, but here many times lies the root of the pinhole evil. The material to be sprayed should be of the proper consistency for each kind of wood. Best results are obtained with a mixture of about 8 to 10 pounds of paste to the gallon. Having the proper mixture, care must be exercised not to use excessive pressure. The range of pressure at which fillers of different consistencies are successfully applied is from 25 to 35 pounds. Material must be agitated continuously. Sprayed filler is applied much faster and more uniformly.

Can Shellac Be Sprayed Successfully?

The practicability of spraying shellacs has been discussed pro and con. The continued use of the spraying equipment in the larger and more progressive furniture manufacturing establishments for the handling of this material is a vindication of the spray system. Shellac to be properly applied by this method

should not be mixed over 2½ pounds to the gallon. On account of the highly volatile solvent, high air pressures are never recommended. Spraying at close range will not only save material but will in connection with proper mixture and air pressure, give a smooth, more uniform surface than is possible by brushing. This will again result in saving in the sanding operation to follow. A medium sized nozzle is recommended for spraying shellac.

Varnishes and enamels were among the first materials to be successfuly sprayed. The materials giving good results when brushed were found to give equally satisfactory service when sprayed. Occasionally the spray was blamed for inferior finishes, it



Large spray booth in Kent-McLain showcase factory, Toronto

being claimed the material was not suited to the method. There is no ground for such claim. Irregularities in the finish can always be traced either to inferior material, improper treatment of the undercoats, too rapid drying or misunderstanding on the part of the operator. But the spray equipment is not to be held responsible for defects due to improper filling, improper sanding or rubbing, poor material or operators who do not understand the equipment they are working with.

Does Spray Cause Pin Holes.

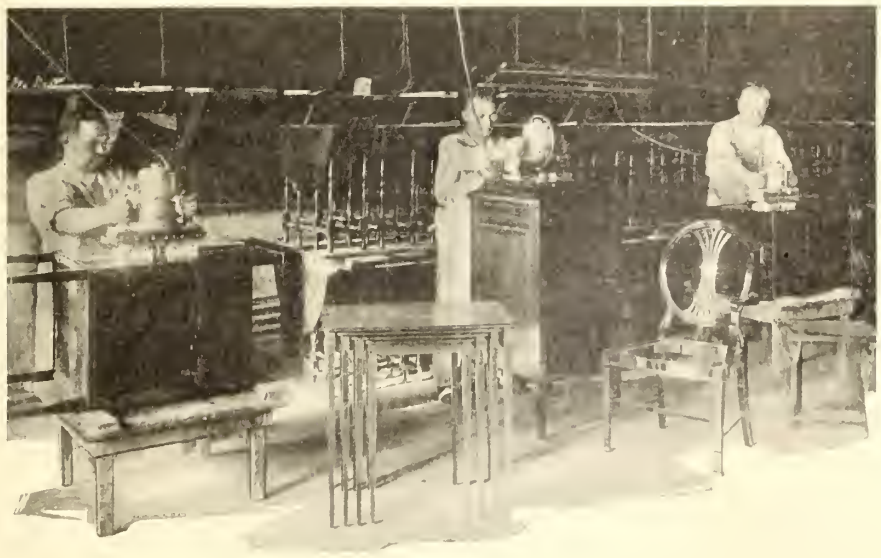
Such defects as pinholes and pebbling are often laid directly to the spray. Pinholes can invariably be traced to the filling coat. If the pores are not properly filled a high class finish cannot be expected. What holds for the brush will hold for the spray. Pebbling is due to an imperfect flowing out of the material. Varnish, work, or finishing room not being of the temperature required for good work, is commonly the cause. Cold varnish applied to a surface of different temperature in a room of a still different temperature will not give good results when brushing, neither can good results be expected from spraying under such conditions. Oil or water in the air is a condition which causes trouble. Holding the spray too far from the surface and swinging it recklessly back and forth and expecting the surface to be uniformly covered at the end of such a series of physical exercises is beyond all reason.

To insure a perfect sprayed coating use the following precautions: 1. Have the material, your work and the finishing room at as near even temperature as possible. 2. The air must be free from oil and water. (Condensers are to be had for removing moisture, also filters for oil and means for controlling the air pressure). 3. Use even strokes in going across the surface in systematic fashion, being certain that laps are properly made. 4. Electric heaters for heating both air and material counteract the natural cooling tendency of expanding air and frequently overcome the pitting effect.

How to Secure Best Results.

Lacquers are being used quite extensively in the finishing of furniture today. The only practical way to coat the average piece of furniture with this material is by the spray method. Lacquers, requiring a highly volatile thinner, are sprayed with as low an air pressure as is consistent with good results. Too high

(Continued on page 158)



A battery of electric rubbers in finishing room of large furniture factory

FLINT

Announcing

Blue Diamond Finishing Line

Pyroxylin Lacquers for Art Finishes.

Pyralin Enamels

Bridgeport Stain

Wheelers Wood Fillers

Cabinet Rubbing and Polishing Varnishes

Flintsatin Cabinet Finish

Furniture Enamels and Undercoats

A request from you will bring our service man to your plant who will be glad to demonstrate any of above products without obligation to you.

Flint Varnish & Color Works
of Canada Limited

Owned and operated by
Canadian Explosives Limited
Perth & Kingsley Aves. -:- West Toronto

Development of Walnut Finishes

Different Methods for Handling This Wood—Yellowish Brown and Dark Brown Tones Popular—Pale, Light-bodied Varnish for Best Results

By Paul S. Kennedy*

The present vogue of walnut furniture has had a decided effect upon piano finishes in particular. Curiously, there has not been a pronounced increase in the output of walnut cases, but there has been a decided change in the finishing of mahogany. Among the producers of the better class of instruments harmonizing brown stains now predominate, whereas reddish mahogany finishes were formerly standard.

During the war, difficulties were encountered with the satisfactory supply of red anilines and the furniture adopted browns in the emergency. The public eye having been trained to regard mahogany as reddish and walnut as brown, it was psychological that the brown stained mahogany should stimulate a demand for the walnut. Coincident with this, is the demand for pianos to harmonize in finish with walnut furniture.

What the Buyers Want

Because of the peculiar grain of walnut, and the sappy portions in veneers, it presents some finishing problems and possibilities which are being exploited to feel the public pulse. The writer has talked with the heads of two houses quite generally regarded as the leaders in the piano and art furniture fields. Both agreed that their idea of the finest finish on walnut was one which showed the grain and imitated closely the painstaking French Polish finish so popular in Europe.

The piano man thought the ideal finish, after staining, was to double-fill and carefully clean off: four coats of thin shellac (about 1½ pound cut) brushed on and sanded between coats with six 0 sandpaper; then rub in a circular motion with double 0 steel wool.

The furniture man was partial to one coat of filler and one or two coats of pyroxalin lacquer sprayed on and rubbed when dry with double 0 steel wool. These were typical of the highest type of art finishers, who cater to a limited and exclusive trade.

Sounding the feeling among others, most thought that the general buying public would demand a varnish finish; and that the popularity of grain-showing and antique finishes with them would be spasmodic; especially if some of the finer touches of cabinet making were lacking.

Tendency in Shades and Tones

The color tendency in walnut finishes is divided between a so-called cold or yellowish brown and a warm dark brown. There is generally very slight

(Continued on page 158)

*Manager Industrial Department, Murphy Varnish Co., U.S.A. and Dougall Varnish Co., Montreal.

The Finisher's Dream Realized

The dream of the furniture finisher, that some day there would be found a finish that would eliminate many of the troubles of the finishing room, and at the same time would produce results superior to any other known process has been realized in ZAPONITE, the Pioneer Wood Lacquer.

ZAPONITE is a *real* wood lacquer—not an experiment, but a real, honest-to-goodness finish.

ZAPONITE will do all that is claimed for it. It produces a finish that is hard, durable and water-proof. It will not scratch nor show white marks. It will not check, paper-mark nor craze. Steaming dishes and boiling liquids do not mar it—it is unaffected alike by heat or cold.

What more could be desired in a finishing material?

CELLULOID ZAPON COMPANY

200 FIFTH AVE. NEW YORK, N.Y., U.S.A.

CHICAGO, ILL. LOS ANGELES, CAL.

THE PIONEER ZAPONITE WOOD LACQUER

Why Waste Money in Your Drying Room?

Air-drying of coatings of any kind is out of the question. No manufacturer could afford it even if the best drying conditions always prevailed—which they do not.

But with Nichols Varnish Drying Equipment you always have very much better than the best natural conditions, reducing days of drying to hours, and the drying is better done: "From the inside out."

This is accomplished by producing always and automatically the correct combination of temperature and moisture, and of air that is absolutely clean.

Why is a Spray Head?

Furthermore, the spray for washing the air in Nichols Drying Equipment is produced in a simple and ingenious manner without the use of the spray nozzles, connecting pipes, pump, and strainers, all of which require so much attention and give so much trouble.

We urge manufacturers to ask us for description of apparatus and for records of its accomplishments, saving single manufacturers many thousands of dollars in reducing the time the product is held up in drying, and increasing the quality besides..

A. S. NICHOLS COMPANY Aeolian Hall New York City

Manufacturers alo of

Nichols Lumber Dryers, Veneer Dryers and Hydraulic Pumps

Increasing the Speed and Decreasing the Cost of Your Finishing Room Operation

How practical, how advantageous and how dependable DeVilbiss Spray-painting equipment is, has been demonstrated in finishing rooms of every size and line.

Not merely in dozens of finishing rooms, but in thousands of them. Not only where a few different kinds of articles are handled, but where every kind, size and grade of wood or metal product is finished. Not alone where varnishes, enamels or lacquers are used, but where every kind of liquid finishing material is applied. The

DeVilbiss
Spray-painting System

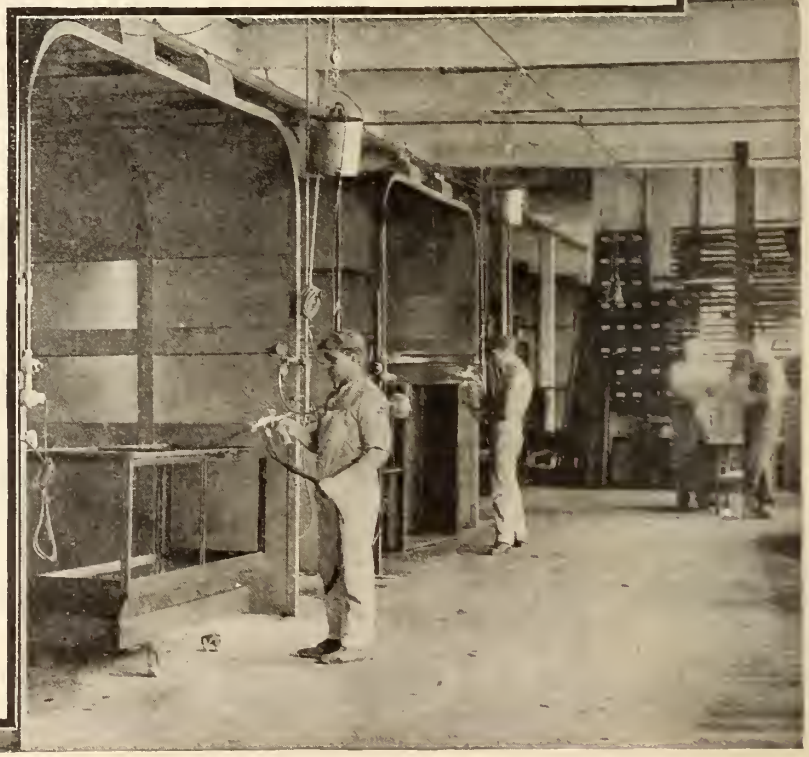
offers a complete, adaptable and guaranteed service. The finishing operation is speeded up 4 or 5 times over hand-brushing. A perfect, uniform coating is applied on all jobs. Working conditions are made more healthful and safer. Operating and upkeep costs are reduced to the minimum.

With your consent, we'll gladly tell you whether and how the DeVilbiss System can be of service and profit to you.

The DeVilbiss Mfg. Co.

3718 Detroit Ave. *Toledo, O., U.S.A.*

Paint your factory walls faster and better with the DeVilbiss Spray-painting portable equipment. Let us explain.



Linseed Oil has its best equivalent in "FLAXICON." Either in boiled or raw, is elastic, durable and waterproof. Working to the best advantage with colors ground in oil.

Penfound Varnish Co.
CARIBOO AVE. - TORONTO

"ENAMELS"

Our business in both White and Old Ivory Enamels and Primers has trebled during the past year.

WHY?

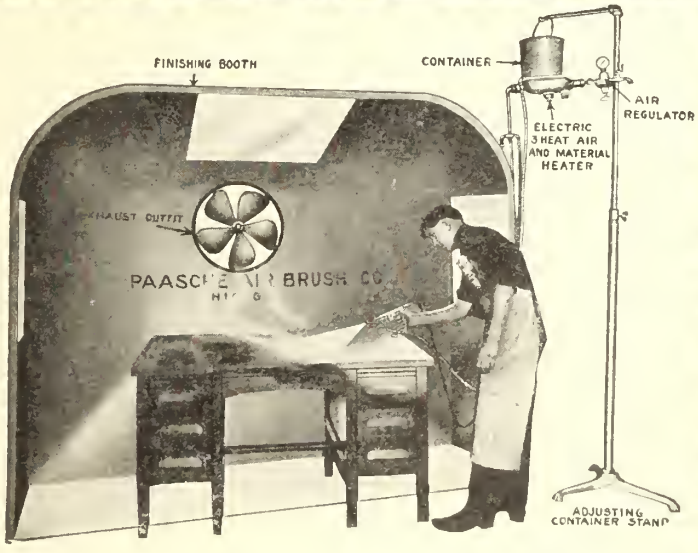
They are the best on the market. If you are not using them, write for samples and prices.

The
Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

PAASCHE

Paasche
Makes
Finishes
Stay

PNEUMATIC RUBBING MACHINES
are rapidly replacing HAND Rubbing and Polishing. RUBS AS EFFICIENTLY AT 4 P.M. AS AT 8 A.M. Girls Can Operate Them.



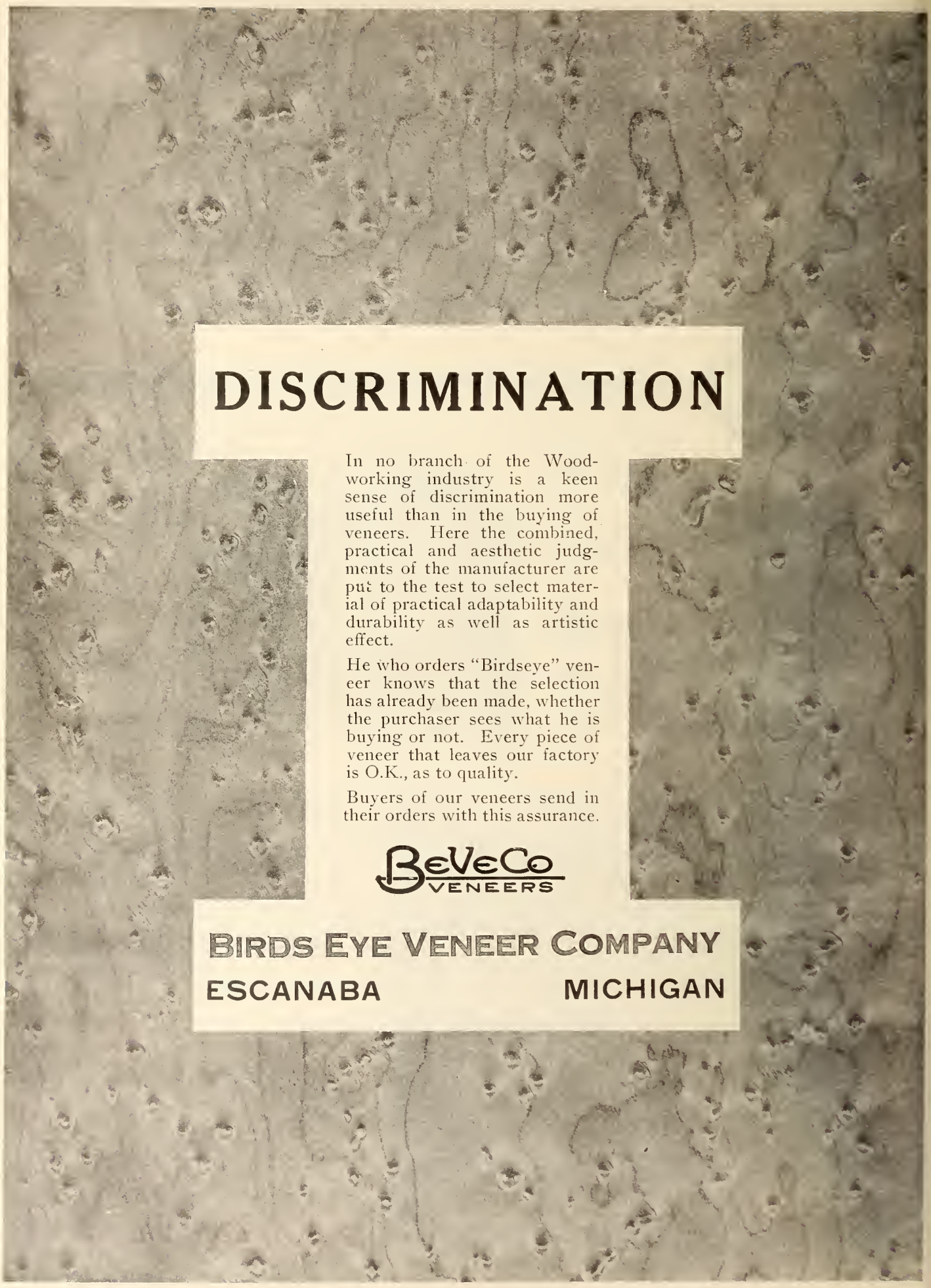
Paasche Air Brush Co.
1223 W. Washington Blvd., Chicago, Ill.

On all surfaces that are to receive hard wear a finish put on with a Paasche Air Brush will give many times longer service because the Paasche method gets better penetration of the paint or varnish; because the air brush puts the finish on smoother with no runs, sags, or fatty edges, and no thin spots to wear through. As a protective measure, a Paasche finish can not be equaled with the old fashioned hair brushes.

Write us for full particulars and for our suggestions

Here's a Suggestion

Do you ever try keeping a file of your back copies of the "Canadian Woodworker"? Try it. Start with this issue. There are many articles that are worth keeping, as they offer valuable suggestions that will help you in your business.



DISCRIMINATION

In no branch of the Woodworking industry is a keen sense of discrimination more useful than in the buying of veneers. Here the combined, practical and aesthetic judgments of the manufacturer are put to the test to select material of practical adaptability and durability as well as artistic effect.

He who orders "Birdseye" veneer knows that the selection has already been made, whether the purchaser sees what he is buying or not. Every piece of veneer that leaves our factory is O.K., as to quality.

Buyers of our veneers send in their orders with this assurance.

BeVeCo VENEERS

BIRDS EYE VENEER COMPANY

ESCANABA MICHIGAN

Veneers and Panels

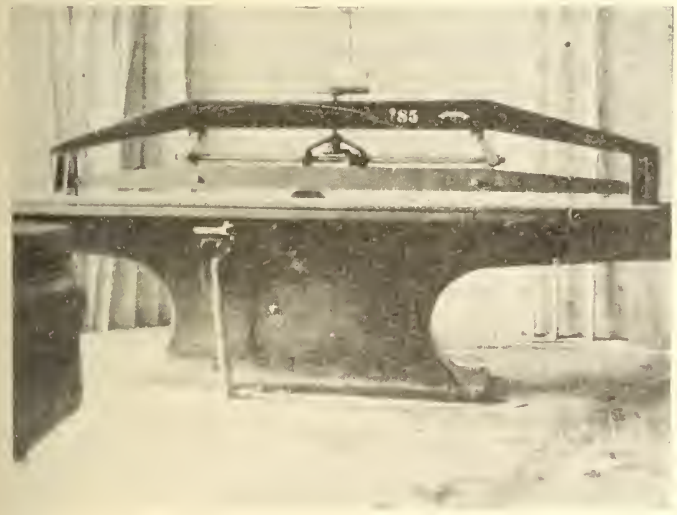
Is Your Veneer Room on an Efficient Basis?

Many Veneer Departments Lack Special Redrying Equipment—Essential That Stock be Dry and Straight—Labor-Saving Machines Play Important Part in Veneering Operation

By Edw. D. McConnell*

The two prime factors of greatest interest to furniture manufacturers are quality and quantity production; particularly now when quality is the keynote to success. In the manufacture of furniture, particularly that made from solid lumber, a great deal of attention has always been given to the proper drying of the stock. The study of efficient drying methods has at one time or another claimed the attention of most successful furniture makers. By the drying of lumber, we refer not only to the proper kiln-drying of the stock going into the product, but also to the lumber used in making up cores, when veneers are employed for surface effect in producing fine figured stock.

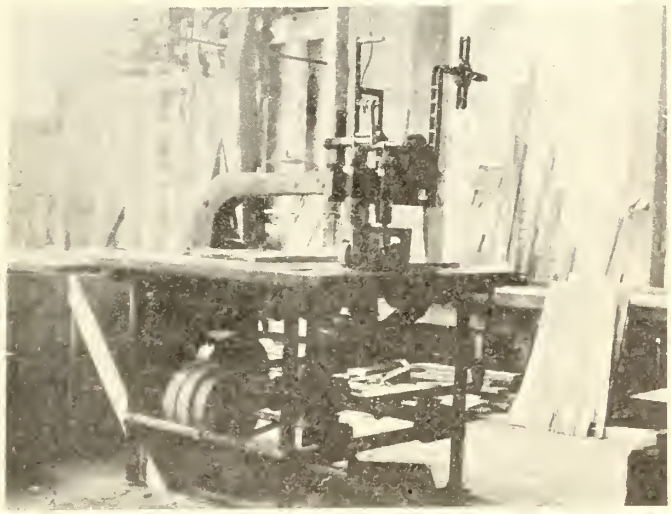
Few furniture manufacturers would think of taking the lumber from the yard or storage and making it up into the finished product without, at least, making some attempt to remove what surplus moisture it may contain. Yet this is exactly what many are doing in the case of veneers. They work on the theory that the veneers they purchase are thoroughly dried by the manufacturer and shipped in closed cars



Preston veneer jointer in plant of R. Laidlaw Lumber Co., Toronto

to destination where they are unloaded and placed in storage and assume that the veneer is suitable for gluing without any further attention. This is a serious mistake, as veneers take up atmospheric moisture quite readily, both in transit and while in storage. As a result they contain entirely too much moisture to be laid without re-drying, especially when account is taken of the fact that the glue itself contains moisture which has to be absorbed by the veneer and core.

When it comes to the manufacture of furniture in which veneer and plywood predominates, the fact seems to have been overlooked that the drying of



Veneer taping machines are found in more up-to-date plants

veneer requires as much, if not more, care and attention than the drying of thick stock. Due to this lack of knowledge or lack of care, a considerable amount of trouble is experienced with built-up or veneered material. This takes the form of the veneers peeling or blistering, the edges coming loose, and often trouble with the finish. The fine checks, sometimes called "varnish checks," which so often appear, are due almost entirely to the veneer not having been properly dried before laying, and as a result checking under the surface of the varnish. Poorly-dried veneer is often the cause of pitting. In like manner the wavy effect so often seen on table and dresser tops and other large surfaces, is directly due to improper drying in nine cases out of ten.

Defects of this nature reflect back on veneer and on any product on which veneer is used and may be given as one reason why the retail furniture dealers, and the buying public in general, usually prefer solid to veneered construction. This, in spite of the fact that if made right, veneered or built-up furniture is far superior in every respect to that made of solid material.

Equipment for this Department

For this reason if for no other, the manufacturer of furniture should give special attention to the drying and re-drying equipment which he has installed

*Merritt Sales & Engineering Co., Lockport, N.Y.

in his plant. This includes the operation of the drying apparatus, for trouble may result because the operator is careless or is not thoroughly conversant with his equipment and work. Sometimes, however, the trouble is due to the fact that the equipment supplied is not altogether suitable for the work on hand.

The veneer department in a moderate-sized furniture factory might well contain the following equipment:—A strong, durable dimension veneer clipper for sizing the veneers to approximate sizes ready to glue up: a hot plate veneer re-drier to remove all moisture from the veneers, which at the same time leaves the stock in a flat condition, this redrying process also shrinks the veneer to a minimum by removing the moisture: Two glue mixers and a spreader of approved design: One hydraulic press with loading and unloading device and sufficient retainers and caulboards to allow the stock to remain in clamp until the glue is properly set. A seasoning room for stock returned from the glue room.

Other machines in this department might include double cut-off saws for sizing the veneered stock, a three-drum sander and two belt sanders for finishing the material before it passes along for succeeding operations. Two other pieces of equipment, which might be used to advantage, are a veneer jointer and a veneer taping machine for handling the face stock and cross banding before it is glued. This equipment is all that is required for a plant using up to 10,000 square feet of three-ply stock per day. Where veneer is used for the cores or centres, if lumber cores are used, then the equipment must be enlarged upon and the following machines will be found necessary to convert the lumber into staves or built-up cores:—Rip saw, cut-off saw, glue jointer, surfacer, sander and proper gluing clamps. In many plants most of the woodworking equipment mentioned will be found in the machine department, although a number of sanders might well be included in the veneer room.

The glue room or veneering department is even assuming greater importance, due to the increased use of veneers and also because of the fact that modern veneer room equipment has resulted in increased output and lowered cost. For this reason it is well for every furniture manufacturer to give a little more thought and attention to this department and see if he can not make a few desirable changes which will tend to bring this department up-to-date. Probably the most important phase of the veneering operation and the one that is most often overlooked has to do with the drying of the veneer and crossbanding. If your veneer room equipment is weak in this respect it is certainly worthy of a little investigation and study.

Drying Plywood to Cut Finishing Costs

Thoroughly Dry Veneered Work Takes Smoother Finish, Reducing Finishing Costs—Special Drying Equipment Advisable—Even Circulation of Prime Importance—Temperatures and Humidities to Carry

By C. A. Cutler*

A single thin coat of varnish on glass will rub to a perfect surface because it is spread on a smooth level surface. The necessity for several coats of varnish on wooden surfaces is due principally, to the irregularity of the surface and much time, labor and material could be saved if greater care was taken in the preparation of the surface. In other words, more care given to the sanding will make a great saving in the finishing coat. Good sanding should produce a level even surface and all the open pores of the wood should be free from sand-paper dust. Filler will not fill or hold up if laid on top of fine wood dust that changes its volume with each change of weather.

Sanding is an operation, the quality of which varies directly as the quantity of moisture contained in the wood being sanded. Very dry panel work will sand cleaner in less time and with less cost of paper than the panel with more moisture in it. The moisture in the panel causes the wood fibre to be soft and they do not cut off clean as when dry. The wood dust from damp wood will pack into the pores when dry dust would be carried away by the air following the sand belt. If the panel is not dry when sanded the loss of this moisture at some later time will cause a shrinkage that will make the surface wavy and irregular.

Special Drying Room Essential

Now granted that the panels ought to be very dry when sanded then the problem is how to get them into that condition. The quickest and simplest way of course is to put them into a dry room. The length of time from their release from the retaining clamps to their placement in the dry room will depend upon the kind of glue used. A perfectly safe rule would be to pile them open with cleats placed carefully one directly over the other and let the pile stand in an open room at least twenty-four hours. This tends to straighten them out while they are still flexible so that when dried they will remain straight.

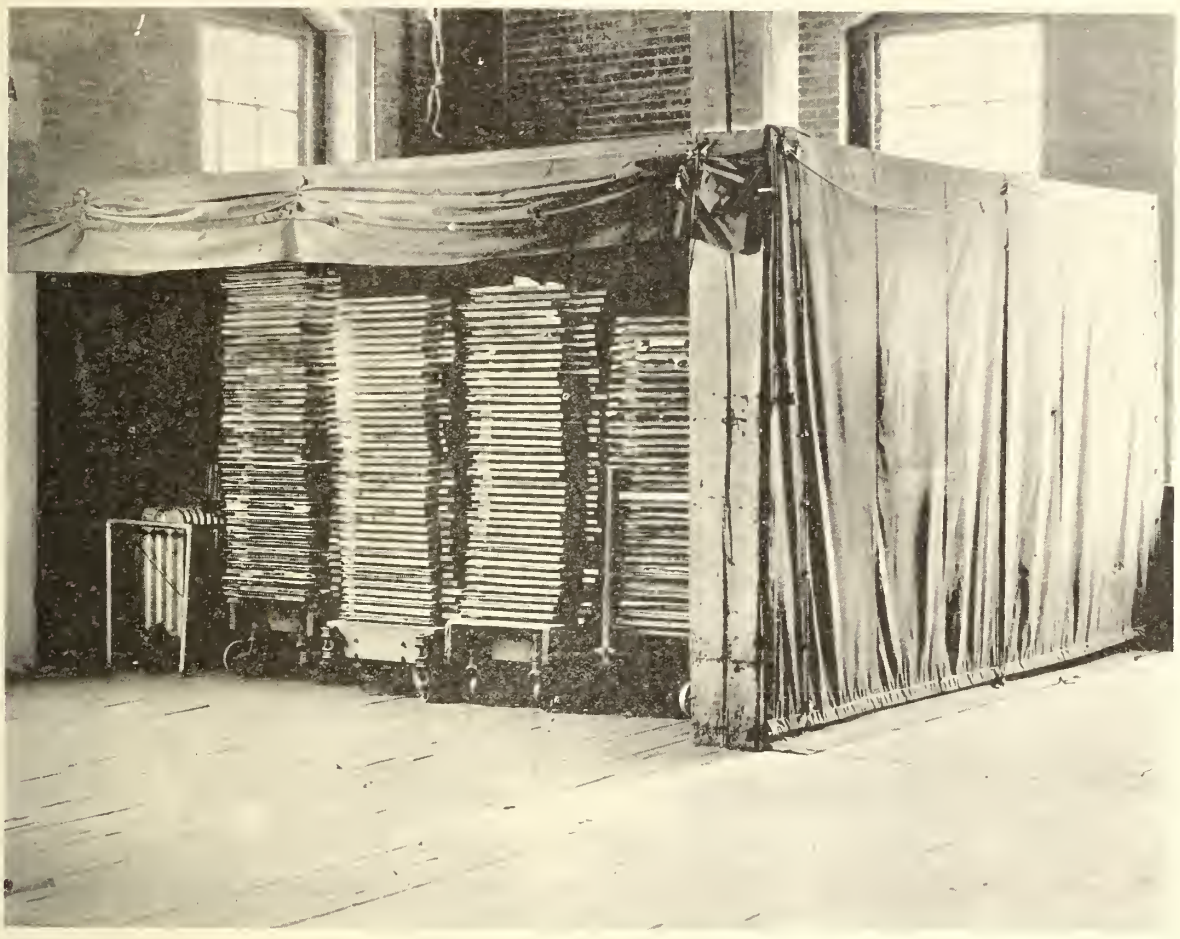
The treatment of the panels in the dry room will depend upon the kind of dry room. If the room is so constructed that the temperature, top and bottom, is substantially the same and the air circulation is such that it will pass through the panels at a reasonable speed, then a temperature of 120 degrees and a relative humidity of 45% will dry the panels in fourteen hours, or over night, so that they would be in good condition for sanding.

Even Circulation Required

In dry rooms where the heat rises directly up through the kiln it is very difficult to get any circulation between the panels and, therefore, the edges of the panel dry first and this causes a great deal of trouble on account of warping and even sometimes splitting. With this kind of dry room a temperature of 90 degrees would be better but, of course, the length of time to dry would be much longer.

The panels might have been piled on edge so that the air currents would pass through them but, this would also result in warping as the lower edge would dry first and those at the bottom of the kiln would receive a more rapid drying than those above them.

*President, Cutler Desk Co., Rochester, N.Y.



Showing panels being dried in special kiln

The best way is to provide for a circulation that moves across the kiln room.

A blast or a blower is not proper for this kind of work, because it will pile up and eddy around the piles instead of going through them. A steady, constant breeze over the whole room will find its way into every layer and will result in even drying that is controlled by the temperature of the room. The placement of the piles in the room is of importance. The cleats between panels must always be in the line of current and not across it and in all cases there ought to be free air space between the bottom of the pile and the floor of, at least, eighteen inches. It is surprising how the allowance of this free air space will improve the drying even in an improperly built dry room.

When Face and Back are Different

With a proper current the drying of panels with faces of one wood and backs of another can be provided for by using different thickness cleats. In the case of Quartered Oak faces and Poplar or Gum backs, the faces should be towards each other with 13/16″ cleats between them and the backs together with 3/8″ cleats between them. This prevents the backs from drying before the faces as they would do if the drying conditions were the same on both sides.

It is extremely necessary that the core stock should be extremely dry before pressing. The moisture from the glue next to the core must be taken up largely by this core itself before the glue will set, but this same moisture must come out again through two layers of glue and two layers of wood in the case of five-ply. This drying of core moisture is extremely slow and goes on for several months under ordinary shop conditions.

The moisture that can be rapidly dried out of five-ply stock is largely that moisture that has been introduced into the faces, backs and cross-bands in the process of gluing. This accounts for the fact that there is very little difference in the drying time between thick and thin panels.

Should Condition Gradually

The placement of panels in the dry room before the glue has thoroughly set sometimes causes trouble and this is the reason that twenty-four hours are allowed after release from the clamps. The dry room should be loaded before the steam is turned on so that the temperature of the panels is raised slowly and more evenly than would be the case if the room was hot when the panels went into it.

A large percentage of the dry rooms used for panel drying are very unsuited for this purpose. It is quite obvious that drying conditions ought to be near the same in all parts of the room. The drying conditions are dependent upon the heat humidity of the air in the room. The simple test of feeling with the hand the temperature of the surface of a panel at the bottom of the pile and another at a height of about six

feet from the floor, will surprise most kiln operators. They will find a difference that is so great that they will need no other proof that the room is not properly built. The drying speed is either too slow at the bottom or too severe at the top and it is certain that the top and bottom panels will not be equally dried.

When the dry room of this kind is operated at any given temperature and humidity it means that the air at the level of the thermometer only, is at that temperature and humidity. The air above this particular level is hotter and dryer and the air lower is colder and wetter. A difference of 95 degrees and humidity of 75% will have about half the drying speed of a temperature of 130 degrees and 35% humidity, yet these two conditions are often found at the top and bottoms of kilns that are supposed to be operated at 120 degrees and 45% humidity.

Necessity for Uniform Conditions

There is very little difficulty in drying panel stock if the dry room is built correctly to maintain even temperature in all parts and a circulation of sufficient speed. Home-made dry rooms, and even those put in by engineering concerns, are often without these two very necessary features and the operator is at a loss to determine what is best because panels taken from the same pile and supposedly treated all the same will show extremes of too little drying and too much drying. If the dry room was operated one time at 95 degrees and 75% humidity and the next time at 130 degrees and 35% humidity no one would expect very good results. Neither can good results be expected when these two sets of conditions exist at the same time.

No well operated factory can afford to wait for panel stock to dry in the natural course of events although it is difficult to convince some plant managers of this, but if they knew that ever so often a lot of panels become so badly stained that they cannot be used for regular color and that this staining was due to slow drying, they could quickly figure how a good dry room would pay for itself in a short time.

The shortening of any process has the following values. Reduction of stock necessary for a given production. Increase of production or saving in floor space. Less time between the order and the actual production of the piece. Closer relation between actual sales and production orders. Closer adherence to production orders because of definite knowledge just how long a time is required to produce a given piece. Better quality of production because the best possible conditions can be determined and maintained. These conditions being known as the planning department is not dependent upon a department foreman for information as to availability of stock ordered into process at any given date.

Making "Lamatco" Cottonwood Panels

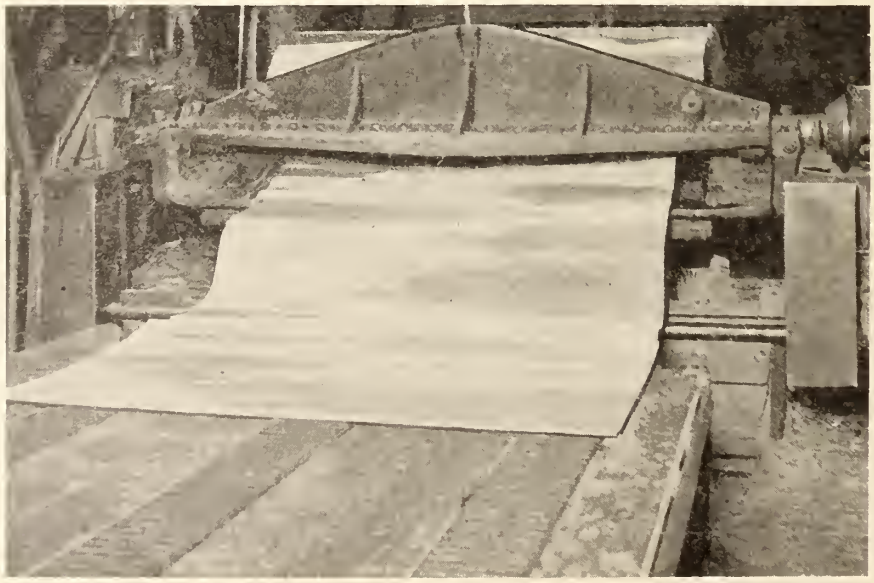
Plant at New Westminster, B. C. Has Developed Production to High Degree—Sanders in Tandem Take Care of Sanding—Material Used Extensively in Building Industry

By G. S. Perry, Vancouver Editor

Using cottonwood as the raw material, Laminated Materials Co., Ltd., of New Westminster, B. C., is manufacturing plywood panels on an extensive scale, for use in many branches of building. Cottonwood is indigenous to the valleys of most of the British Columbia rivers and on the Coast it grows to large proportions. In the Fraser valley, there is a sufficient quantity of this timber to ensure supply for years to come. Its rapid growth points to possibilities of replacement as the supply is cut off. Making plywood panels on an extensive scale, the company at New Westminster has developed and patented a process, portions of which are of course trade secrets.

To turn out large quantities of standard panels

(Continued on page 154)



Large veneer lathe cutting cotton wood log

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.

Quite Often

you will find the very thing you are looking for in these advertising pages .It will pay you to read them.

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.

SEE OUR ADVERTISEMENT PAGE 15

VENEER MERIT MACHINERY VENEER MERIT MACHINERY

FOR FAR SIGHTED BUYERS

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.
"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.
(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

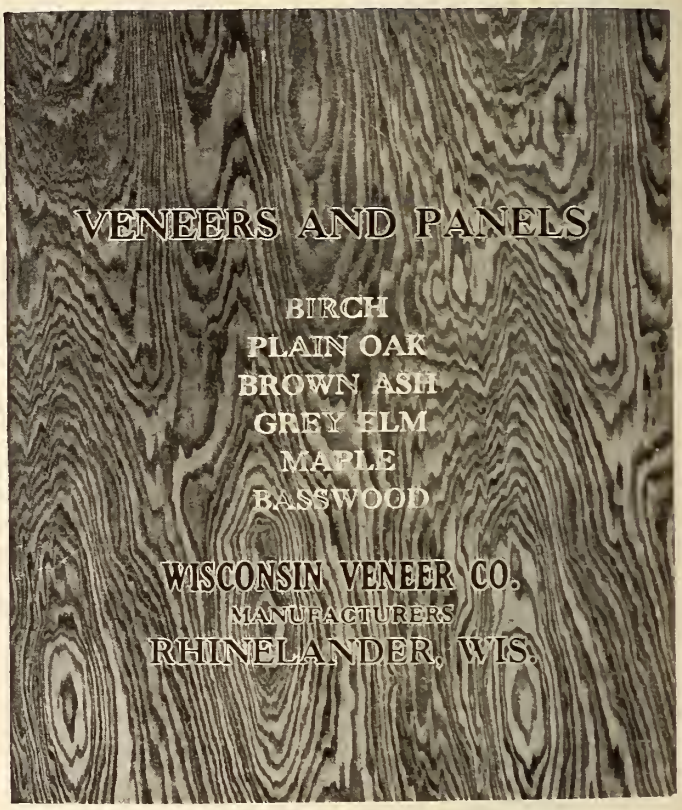
Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.



Litton Veneer Co.

Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill

ROCKFORD - ILLINOIS

J. W. Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers

Oak Lumber and Veneers

Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Poplar and Walnut

Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND.

HOFFMAN BROS. CO.

ESTABLISHED 1867 - INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car 1/20′	Red Oak (log run)
½	Car 1/16′	Red Oak (log run)
½	Car 1/20′	White Oak (log run)
¼	Car 1/16′	White Oak (log run)
1	Car 1/28′	Walnut (half round)
25M	1/28′	Poplar Crossbanding
5	Cars 1/8′	Poplar (log run)
2	Cars 1/8′	Poplar (corestock)

Prices by wire on receipt of your inquiry

HB

Reg. U.S. Pat. Off.

FORT WAYNE, IND.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

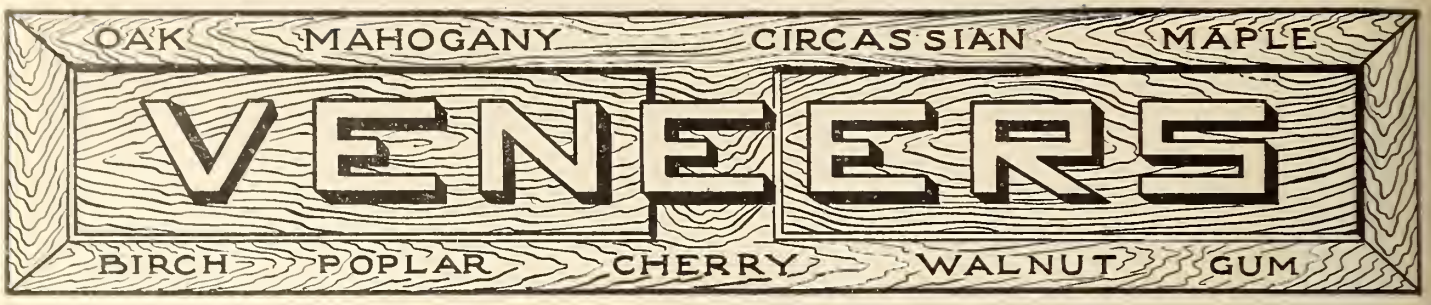
The Standard Veneer Co.
Portland, Maine

Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

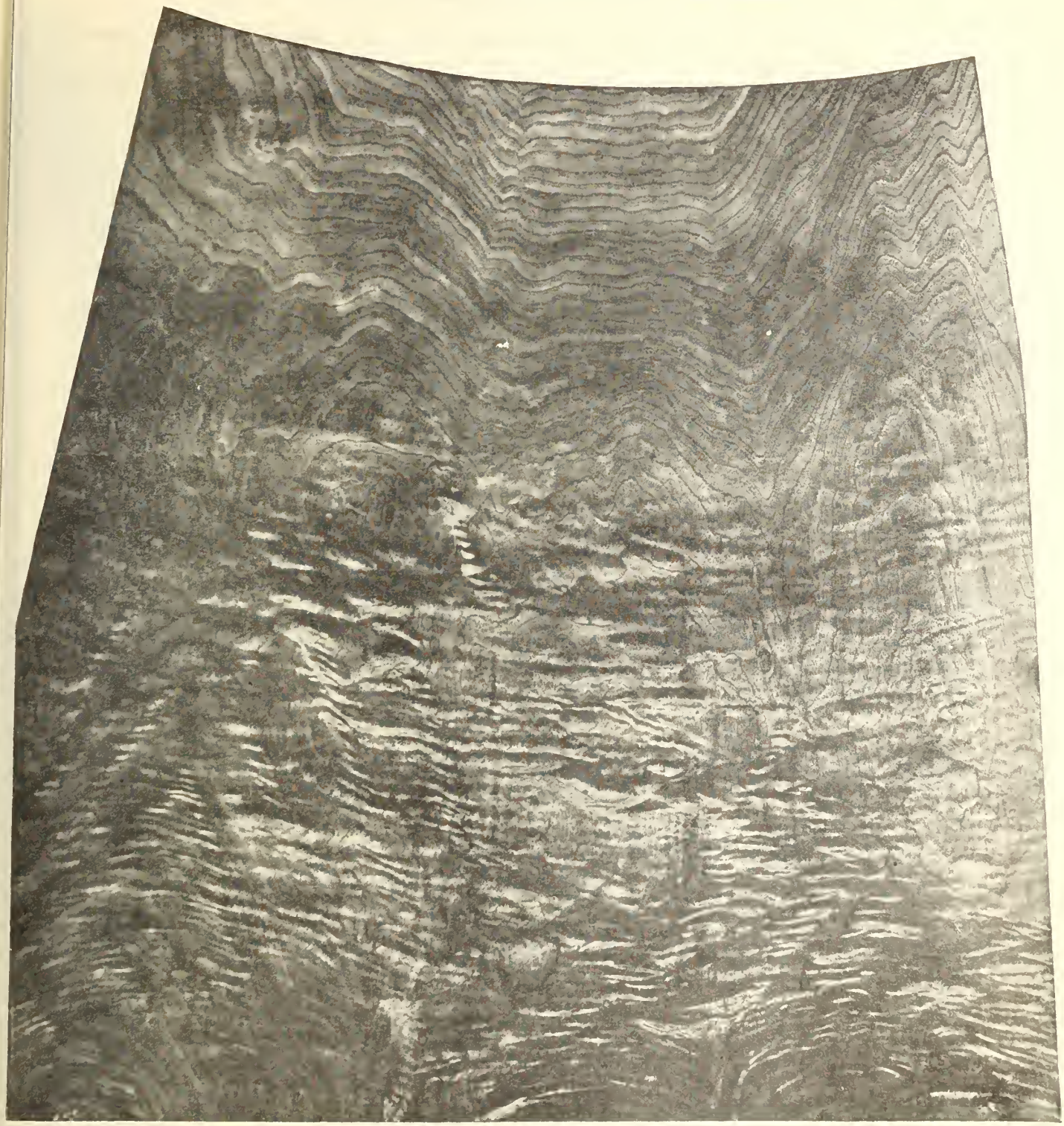
May we know your requirements early?

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.



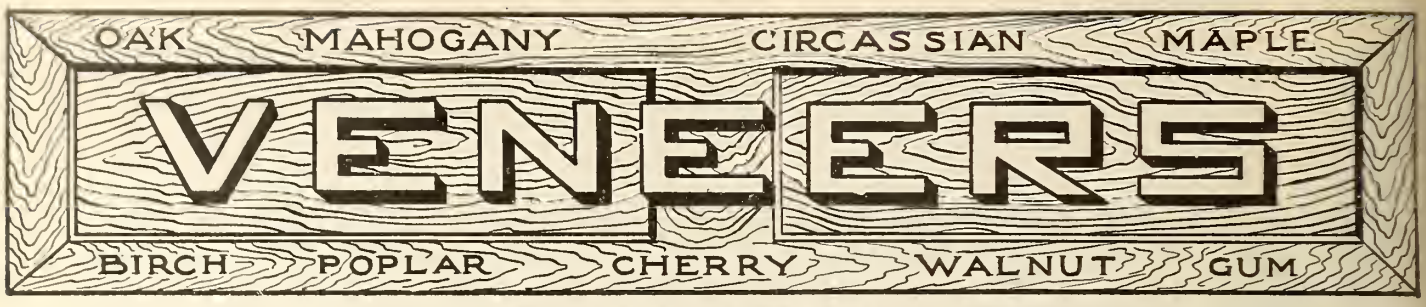
American Walnut Stump-Wood

Manufacturers of
Quartered Oak
Walnut Veneers

Walnut Stumps and Long Wood
Hardwood Lumber
All Thicknesses

F. M. Bachman Company

Indianapolis - Indiana



VENEER MANUFACTURERS COMPANY
IMPORTERS MANUFACTURERS

THE LARGEST AND BEST STOCKED WAREHOUSE IN CHICAGO

ROTARY CUT SLICED SAWN FIGURED AND PLAIN VENEER AND PLYWOOD PANELS

IMPORTANT!
A new lot of 1/20 and 1/28 in. Sliced cut Mahogany, Well Figured, With a Pronounced Stripe, Well Manufactured, at Remarkably Low Prices.

Send for Samples of this New Lot.

You Can't Duplicate This Stock Anywhere near the Prices we Offer.

1036 W. 37th. St. Chicago, U. S. A.

QUALITY *SERVICE*

PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut
Exclusively

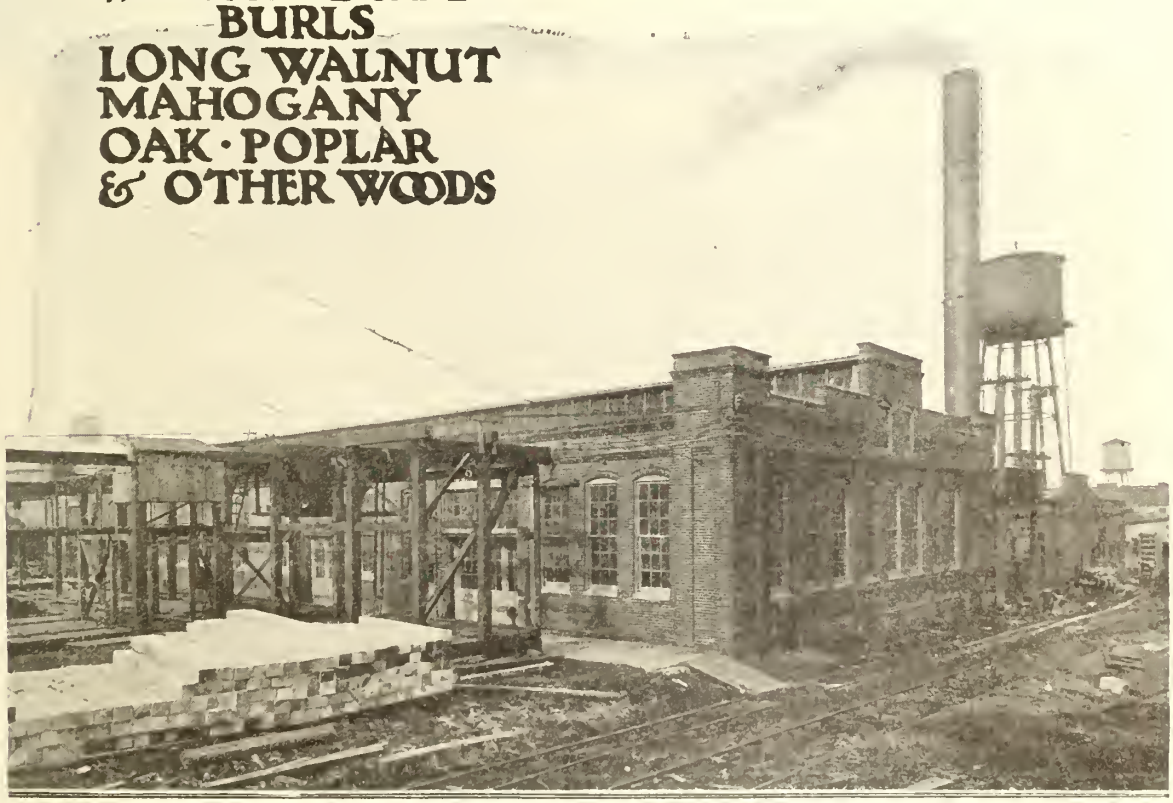
Woodruff and River *New Albany, Ind.*

MILLS - BALTIMORE, MD.

Quality Veneers in

WALNUT BUTTS
BURLS
LONG WALNUT
MAHOGANY
OAK · POPLAR
& OTHER WOODS

Sales Branches:
NEW YORK CITY
709 Sixth Avenue
CHICAGO, ILL.
28 East Jackson Boul'v'd
HIGH POINT, N.C.
JAMESTOWN, N.Y.



CUTTING-MILL FROM THE REAR - SHOWING SUPERSTRUCTURE OF THE VATS.

THE WILLIAMSON VENEER CO.

VIEWS OF OUR PLANT No. 8. *Photo by Hughes. HGW. Del*

ALGOMA *the Better* Plywood

Circassian Walnut! It's been like opening a Captain Kidd treasure chest to cut these rare logs at Algoma—like lifting the lid on precious gems to see the surpassing beauty of graining opened before our eyes.

Frankly, these logs have exceeded even our hopes and expectations—they will surpass yours. Circassian Walnut has been off the market since 1914. However, the quality of the logs we are now cutting amply rewards us for the seven long years we have waited.

We take justifiable pride in having secured this shipment from far Caucasus—and the finest skill of our workmen is called upon to bring out the fullest matching possibilities of this supreme wood.

Circassian Walnut panels—Algoma made—are ready for you in any size you wish to order.

ALGOMA PANEL COMPANY, *Algoma, Wis.*

We offer the following

Band-Sawn, Splendid Widths
Bone Dry

All eighteen months or older, dry

QUARTERED WHITE OAK

4/4″	FAS	200,000	Ft
4/4″	No. 1-C&S	300,000	"
5/4″	No. 1-C&S	350,000	"
6/4″	No. 1-C&S	75,000	"
8/4″	No. 1-C&S	75,000	"
4/4″	No. 2-Com.	500,000	"

QUARTERED RED OAK

4/4″	FAS	50,000	"
5/4″	FAS	28,000	"
4/4″	No. 1-C&S	125,000	"
6/4″	No. 1-C&S	25,000	"

Wood-Mosaic Company
Incorporated
Louisville, Ky.

How "Lamatco" Panels are Made

(Continued form page 144)

the plant is arranged for speedy and continuous handling of the material. The logs are brought to the 9-foot lathe on an overhead conveyor, having been received at the plant both by rail and water from the woods. The lathe which strips the laminations is similar to an ordinary veneer lathe and the cutting is of course done to uniform thickness—i.e. for ⅛ three-ply panels the veneer is cut 17 to the inch; for 3/16 panels, it is cut 12 to the inch; and for ¼ panels it is cut 8 to the inch. Similar standards are adopted for the five-ply and other thicknesses.

Outline of Operations

As the veneer passes from the lathe on a roller system it is clipped to size and passed to tables where the laminations are assembled and the cement, which is a special preparation, is spread on the layers. The panels, for they now assume that shape, pass next to the hot plate presses where both heat and pressure are applied to unite the layers firmly and permanently.

The panels as they are taken from the hot plate presses go through a special drier, in which the process of removing all moisture is completed. The dried panels go then to the trim saws, the first set trimming the sides, and the second, or cut-off saws, bringing the panels to uniform length. The standard size adopted in producing these cottonwood Lamatco panels, as they are now called, is 42 x 66 inches. The 3-ply and 5-ply are the standard stocks made, though for trunk-makers and other special requirements the laminations can be built up to any desired thickness.

After being trimmed to standard size, the panels are put through two 48-in. Yates sanders in tandem. One side is sanded in the first and an operator stationed between the two machines turns each panel before it is fed into the second sander. After sanding the panels they next come into the hands of the grader, who grades them according to four standards established for the product. Every panel is then fine sanded on one side in a third Yates sander. This is the final process and it leaves the wood with a surface so smooth that little or no hand sanding is required for the highest grade finishes. The finished panels are bundled in standard packages 3 in. deep, containing different numbers of sheets according to the thickness of the panels. The bundles weigh approximately 130 lbs. and in this form they are shipped out.

Pressure in the hot presses so densifies the cottonwood that the finishing process on the dried panels makes a perfect surface for the reception of any finish. In use it is found that the wood takes any stain and finish readily and the grain comes out in various pleasing effects. For that reason it is finished to reproduce any hardwood surface desired, where panels of the actual hardwood would exceed cost limits. In this way a very wide range of uses is opening for this material. For door panels, trunks, etc., the five-ply is used, and more laminations as specified in special orders. Possibly the most extensive field opening for this plywood product is for panelling and house lining where ordinarily composition wall-boards have been used. The strength and durability of Lamatco product as well as the waterproof character of the cement used in making it, make it a permanent, not a temporary material where used. Naturally the better grades are used where fine finish is demanded, as for instance in the interior wood of steamers, for which it has been largely used on the Pacific Coast. In war-time the product of the New Westminster plant was shipped to England and largely used in aeroplane construction and other munition work.

With a present capacity of close to 50,000 feet per day, capable of expansion as the market demands, the plant is kept busy at all seasons.

Furniture Jobbers in Canada

Chicago, Ill., 531 Monadnock Building,
Feb. 13, 1922.

Editor, "Canadian Woodworker."

We have an inquiry from one of our members, asking for the names of furniture jobbers in Canada who might be interested in a high-grade line of fancy chairs. If you can give us the names of any such firms, your kindness will be appreciated.

Sincerely yours,
National Association of Chair Manufacturers.

There are not many large jobbing houses in Canada specializing in furniture. In the West there are a few which cater largely to what might be termed a local trade. It is just possible some of the following might be interested in your proposition:—D. V. Cope, Calgary, Alta.; Blowin Henry & Co., Edmonton, Alta.; Potter, Limited, Winnipeg, Man.; Morelock & Co., Vancouver, B. C.; W. Cline, Vancouver, B. C.; P. F. Legare, Limited, Quebec, and W. J. Craig, 215 Victoria St., Toronto, Ont.

Rotary cut cottonwood shows very attractive figure

This Rim Will Eliminate Table Top Troubles

?

THE vexing question of warping or checking is successfully overcome when this Rimbound Table Top is used.

The bent rim is a component part of the table top, and in addition to preventing the slightest moisture from entering the edge of the table, holds the entire top rigid and thus adds many years to its life.

And it not only protects the edge of the table, but provides for a perfect finish as well.

Made for period styles in Oak, Mahogany and American Walnut.

We guarantee this top free from mechanical imperfections and should any prove defective within six months, will replace free of charge.

Note the 1¼ inch rim for Period Tops. It makes a beautiful smooth, practical edge. No end wood to absorb moisture.

We can also supply your requirements in four and five ply table rims and panels, 3 and 5 ply, in all woods.
Mahogany and Walnut, Quartered Oak Veneers and plain rotary Veneers always in stock.

Panels, Limited - Southampton, Ont.

(Operated by Toronto Veneer Co. Ltd., Toronto)

Are You Using Hydraulic Presses?

The hand screw veneer presses and even the power screw machines are being gradually replaced by the hydraulic type of veneer press. One by one more up-to-date plants seem to be turning to the latter class of equipment.

Talking with the foreman of the veneer room of a large furniture factory, the "Canadian Woodworker" asked him why he had put out the old presses and installed a modern hydraulic one. His answer was enlightening and may prove of interest to other readers. "The chief reason why I recommend this machine is that it is the only type of press on the market which tells just how much pressure to suit the stock, and for this one reason alone consider the hydraulic press, equipped with pressure gauge, an absolute necessity. Another feature is that when the amount of pressure being applied is known, the same pressure may be applied to different press loads of the same class of work. The feature of increased production must not be overlooked for with this type of machine I find we can turn out far more work with less effort. One other point I would make is that with the hydraulic press the pressure application is even over all parts of the load, whereas with the multiple screw hand press one screw might be turned down much tighter than the other. I have not touched on the labor involved, for it goes without saying that the hydraulic press can be handled with fewer men and with less labor."

C. L. Willey Company Reorganize

The following letter from A. N. Cordell, president and treasurer of the C. L. Willey Company, Chicago, regarding the re-organization of this company, should prove of interest to buyers and users of hardwood lumber and veneers:

"For the purpose of going on record in the matter of facts pertaining to this company, we are addressing you the following statement regarding the C. L. Willey Company and plans for the aggressive carrying on of this business along lines which will perpetuate the policies of quality manufacture and ethical dealings which have always characterized the organization. While we realize this statement at current date is not strictly news, it is our belief that both the producing and buying trades will be interested in securing the true facts regarding the C. L. Willey Company because of the important position its name has always held in the industry. This statement has not been issued before because there were several points which were not until now ready for publication.

The present personnel of the C. L. Willey Company consists of A. N. Cordell, a close personal friend of Charles B. Willey, son of C. L. Willey, and a former official of the First National Bank of Chicago, president and treasurer; H. B. McClain, who has been associated with the company for many years, vice-president and production manager, and Mrs. Charles B. Willey, chairman of the board of directors.

Thus the Willey name will continue in active association in the business. Mrs. Charles B. Willey for some time before the death of her husband was in close touch with the business and after his death became actively interested. She is a woman of remarkable business acumen and her presence in this official capacity is further assurance that the quality policy of the company will be carried on. We wish to emphasize that this re-organization was effected on the soundest possible line, the company facing the future in splendid condition both as to organization and finances.

Scrupulous attention will be devoted to carrying on the business in conformity to the practices of its founder, who with two generations of lumbermen behind him and an intensive personal experience, founded this business at Chicago in 1890.

The establishment of the Chicago business thirty-two years ago was followed by rapid development in the purchase of foreign and domestic cabinet woods and their conversion into the highest type of finished product, the plant ultimately attaining a veneer cutting capacity of 100,000,000 feet annually with veneer drying equipment for 200,000 feet daily. Mr. Willey very soon came to be recognized as a man of almost magic judgment of logs and how to best cut them.

Mr. Willey's greatest achievement was the building up of an organization, which is substantially intact, for the selection of logs and veneer cutting. So thoroughly were they schooled in his methods that Willey Veneers to-day retain the same high standard of quality.

We will very much appreciate such space as you can give to the above announcement.

(Signed) C. L. Willey Company,
A. N. Cordell, President.

Temperatures for Veneer Drying Room

At the meeting for superintendents held in connection with the annual meeting of the Furniture Manufacturers' Association, the question,—"What is the correct temperature for the kiln for drying veneered work and panels?" was asked. This phase of veneered work has been investigated thoroughly by the Forest Products Laboratory at Madison, Wisconsin. They advise a temperature not in excess of 120 degrees F. Up to this it is quite safe, but over this when animal glues are used, there is a danger of the glue joint giving way. The "Canadian Woodworker" has been in numerous plants in which special panel-drying kilns are found. As a rule the temperature carried varies from 110 to 120.

Someone may raise the question of humidity. When using animal glues it would appear as if dry heat would have less effect on the glue joint than moist heat. If this is true, it would appear as if the humidity should be kept as low as possible when stock glued with animal glue is going through.

In the modern veneer-drying kiln, the circulation is usually forced and the humidity and temperature are under rigid control, often automatic. However, there seem to be many small kilns in operation which are giving satisfactory results and in which no attempt is made to introduce or control the humidity.

It should be understood that sanding belts have a speed which gives the best results. Too fast a speed spoils the cutting edge of the glass or garnet; too slow a speed means waste of time and machinery.

A good many broom handles are being put on the market in a very rough condition. Remember, there are machines especially made for sanding broom handles. Get one, and you will get repeat orders.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

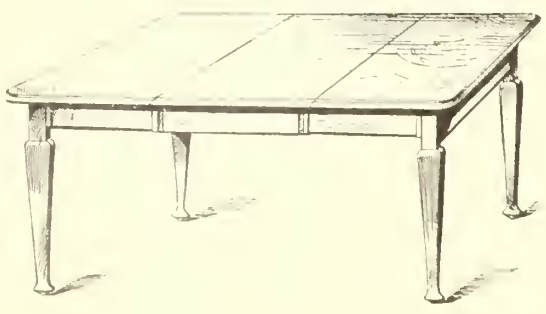
LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

PROMPT delivery in any quantity at very attractive prices. Just let us know your requirements and we shall be glad to forward quotations.

Panels are made in Walnut, Quarter Oak, Birch, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.



HAY & CO., Limited Woodstock, Ont.

Are You Spraying Shellac, Stain and Filler?

(Continued from page 135)

an atomization pressure causes the almost total evaporation of solvent and leaves on the surface only the gum in a granulated form. A small nozzle is never to be recommended. In coating flat surfaces lying horizontally, it has been found best practice to start spraying from side nearest to operator and always working toward the unfinished surface. Thus air is being blown over the uncoated surface and is not retarding the flowing of the material on the coated portion.

How to insure best spray finishing results may be summarized as follows: 1. Have air free from oil and water. 2. Have clean surface, clean finishing room and clean equipment. 3. Never use excess atomization pressure. 4. Stay within a 6 to 8 inch working range. Do not hold spray several feet from surface to be coated. 5. Use the small, round concentrated spray on small narrow surfaces, and the wider fan-like spray only on the large areas. 6. Use heated air when spraying varnishes and enamels, as well as heated material. 7. Avoid waste and delay by using wherever possible the pressure feed material container in place of gravity feed type. 8. Handle spray systematically, in coating the surface same as would be the procedure if brushing.

If above cautions are followed no trouble will be experienced in the spray application of any materials used in furniture finishing. The saving found in application of varnish is also effected in the application of stains, fillers, shellac, enamels and lacquers. What has been found profitable in one case, will be found equally profitable in other cases. Leading manufacturers have many times been repaid for their spray equipment installations, and as expressed by many, "it would be suicidal to return to the old hand brush method."

Development of Walnut Finishes

(Continued from page 136)

shade difference between different manufacturers employing either or both of these characteristic colors.

Where there is sap wood, best results are secured with a double staining operation. The sap is first treated, a very effective method being with vinegar and raw or burnt umber, according to the shade desired. The next day, the final stained effect is produced over all.

In cases where a beautiful, rich natural effect is desired which incidently is very durable and capable of development with age, excellent results have been secured by dipping the wood in the white, in a mixture of three parts turpentine and 1 part China Wood Oil. When dry, fill and varnish.

When it is possible, walnut finish should always be double filled, and a swab coat of very thin shellac is often desirable. This gives the foundation for an ideal varnish finish.

Walnut is a wood which lends itself admirably to dull rubbed varnish effects, but walnut and also the stained mahogany require a different character of varnish to that commonly used on the red mahogany finishes.

The varnishes should be pale and light bodied. Otherwise, when the finish is viewed so as to "look into the pores" it will show an incongruous green. The brown accentuates the tendency of the black filled pores and dark yellow varnish to produce green, which the red partially neutralize.

To secure the real beauty of a walnut finish, the varnish must not only be pale and light bodied enough to give the knitting of coats desirable and possible, but it must contain a hard gum base so that it may be rubbed a smooth satiny finish.

The secret of fine walnut finish is to give the impression of a soft, smooth, wood-like surface with no apparent varnish. Too heavy an application of varnish is to be carefully avoided.

Varnishes with the proper gum base and color will be found to dry slower than the old type of varnishes, but this will not cause serious inconvenience in air dry schedules, and none at all with forced drying. Their tardiness is more in initial drying than in eventual hardening.

Amalgamation of Well-known Hardwood Manufacturers

On the 18th day of January one of the most important amalgamations in the export and domestic hardwood trade took place. The properties of the Darnell-Love Lumber Company of Leland, Mississippi, operating a slack cooperage plant near Leland, Mississippi, and Russe & Burgess, Incorporated, operating one of the most up-to-date band mills in Memphis (all of these plants are in active operation) was taken over by the Turner-Farber-Love Company.

The new company has a paid-in capital of $1,200,000. The personnel of the Turner-Farber-Love Co., is as follows: F. T. Turner, President, G. A. Farber, First Vice-President, European Manager, Headquarters London office, H. D. Love, Second Vice-President, General Manager Headquarters Memphis, R. W. Ricketts, Third Vice-President, Manager Leland Mills, F. G. Woods, Treasurer, Manager Foreign Sales Department Memphis, E. C. Gause, Secretary, Manager Tohula, Miss., Mill, H. Johannsen, Assistant Secretary, Manager General Offices, Memphis, G. W. Harris, Assistant Secretary, Manager of Office, Leland, C. W. Parham, Sales Manager, Headqnarters, Memphis, W. F. Little, Manager Cooperage Department, Headquarters, Leland, Mississippi.

A fourth band mill will shortly be installed to operate a 6,000 acre tract of virgin hardwood timber in Mississippi owned by the company. This will give the T. F. L. Company four band mills with 20,000 acres of virgin hardwood timber untouched, besides stumpage rights of many millions of feet, including forty million of the famous Pantherburn Cypress.

The Leland Stave & Lumber Company, which is part of the new company, operates a slack cooperage mill near Leland, Mississippi, has an annual capacity of 15,000,000 staves. Mr W. F. Little, manager of the cooperage department is an expert in this line, having formerly been with the Ozark Cooperage Company of St. Louis and has entire charge of the management of the cooperage department.

F. T. Turner, the president, is one of the best known lumbermen in the hardwood trade with a practical knowledge of all departments, having made together with Mr. Love and other members of the firm, a huge success of the Darnell-Love Lumber Company of Leland, Mississippi, of which he was president and Mr. Love, vice-president.

Have You Met This Year's Lumber Needs?

The turn of the year has developed a more cleancut picture of hardwood supplies. In the matter of production natural causes are now fully in force in retarding output. What natural causes will not accomplish will be insisted upon by the bankers. Production is definitely prescribed and can not be expanded before spring.

Consumption shows improvement, developing increasing call on already much overstrained stocks. Anderson-Tully's Seventy Million Feet of annual Hardwood Production and the varied nature of its operation have fortunately made it possible to keep our stocks well rounded out. This stock runs in quartered and plain oak, gum and other Southern woods in lumber and veneers and is sold under our consistent high standards of quality and services.

We shall be pleased to help any buyer cover his season's needs.

Anderson-Tully Company

Memphis, Tenn.

ATCo (MEMPHIS) SOUTHERN HARDWOOD LUMBER & VENEER

What's Your Opinion of Double Miter Saw?

(Continued from page 126)

one not so productive, the table is raised by stepping on a treddle.

Other uses might be cited such as mitering the straight pieces for table rims, cutting miter blocks for table frames where K.D. construction is used, cutting the rims for mirror frames on case goods, especially where oval tops and odd shapes are required and many other forms of ordinary work. In one chair factory, they cut back posts for chairs among other items. These posts are cut three at a time, both ends at once, the first day the machine was operated on this kind of work a comparatively green operator trebled the production of back posts over any other method they had been able to devise.

What Manufacturers Say

It may be of interest to read what a number of users have to say. One manufacturer says,—"We are using two medium double miter saws and find them entirely satisfactory. They are both being used on all kinds of square and miter trimming, on stock as short as 9 inches and up to capacity of the machine. We find that one of these saws will do the work of three of our other trim saws on both square and miter trimmings." A manufacturer of refrigerators remarks,—"We have found this saw to be a great time-saver. Formerly we were cutting thousands of miters every day on an old-fashioned machine, and find that our new double miter cut-off saw will turn out at least three times as much work and do it very accurately."

In addition to furniture and casket work this type of machine is also widely used in automobile body plants, where it has been found indispensable in cutting floor boards and many odd shaped parts of the bodies, both ends at once.

What to do to Sit at Boss's Desk

(Continued from 121)

small tools, the purchasing is much less vital. There the materials represent a smaller fraction of the final cost of the product. Labor and manufacturing ability are more important factors.

"So our counsel to men is: 'Analyze the business analyze the people around you, analyze yourself. In the long run, get into a department where profits are produced, or in which for some other reason the chief executives are most interested; avoid the departments which are merely routine, with little or no chance either to make or to save money, and thereby to increase profits.'

Learn to Think, Speak and Write

Among the many other factors that influence men's progress there are two that seem to me especially worth remembering," Dean Donham went on. "The young man in the minor executive job will often be requested by his superior to make reports and recommendations. What an advantage the man enjoys who can express his thoughts clearly, briefly, and convincingly. Every man who seeks to be an executive should cultivate the power to use words effectively in writing.

"One excellent plan for improving business English is to try putting the essential facts of some business problem, that has come up in the course of the day's work, into two hundred words. Lincoln's Gettysburg address is less than three hundred words long; yet many a man dictates more words than that in requisitioning a supply of stationery from the stockroom.

"A second fact worth remembering is that the clean-cuff jobs by no means have a monopoly of opportunity in modern business. Young men, and college men especially, tend too exclusively to look for the desk positions, where they never come in contact with the man on the machine. Yet the job in the plant is often more interesting and quite as productive. For example, the labor problem of the manufacturer is almost surely the storm center of business for the next generation. Can anything be more interesting to the man who has the ability to manage men? Employers frequently tell me of men who miss the big chances in their industries by being unwilling to take night shifts, or to do disagreeable work, or by failing to see the opportunity offered by some minor position.

A Price Must be Paid

Many years ago in a course in Finance at Harvard, Professor Dunbar, who perhaps did more than any other American to develop the theory and science of banking in this country, remarked that there is only one correct rule of finance, and that is to do the best thing you can—under the circumstances. All rules for being an executive are summed up in that one bit of shrewd common sense. Every man in an organization, except the boss, has somewhere to turn for decisions. He has no court of last resort except his own mind and will. He must do the best thing he can under the circumstances. No matter how much help he has, he must weigh the evidence, make the choice, and accept the responsibility for the result.

"The mahogany desk, a good home, a wide variety of comforts are the rewards of his job; but the price is the hardest thing in the world—thinking and acting, making up his mind and then going ahead. No man gets the boss's job who does not begin, even in the ranks, to make some payment every day on the purchase price."

Book on Plywood and Glue

Although originally intended for the aircraft inudstry, "The Manufacture and Use of Plywood and Glue" by B. C. Boulton, B. Sc., is so complete as to be of interest to all users of veneers and plywood. The subject is treated in five chapters as follows:—Manufacture of Veneer and Plywood, General Properties and Use of Plywood, Plywood Strength Tables, Design of Aeroplane Parts of Plywood, and Manufacture and Use of Glues. The chapter on glues treats with the manufacture and use of glues in an exhaustive manner, dealing with such adhesives as animal glue, egg and blood albumen, casein, casein glues, testing glue and relative merits of different glues. Copies of this book may be secured from Sir Isaac Pitman & Sons, Limited, 70 Bond St., Toronto. Price $2.25.

The dado head consists of two outside saws for cutting the grain of the wood. These are very fine tooth saws. The interior between the two outside ones is made up of other saws shaped to make easy ripping.

Made in Canada

The Sidman Lumber Curing Process

IN

Remodeled or new Wood, Brick or *Concrete Buildings.*
Fillers and Glazes to preserve the Building.
Automatic Heating and Ventilating Systems for Varnish Rooms.
Three-ply and Du-o-fold Army Duck Curtains.
Automatic Suction Systems, for returning all condensation direct to the boiler.
Reducing and Back Pressure Valves, Oil and Grease Extractors.
Cantilever Steam Traps and other Steam Specialties.
Active and Non-down Draught Vent Heads for all purposes.
Cleanable Screen Window and Panel Ventilators.
Roller Bearing **Channel** Iron Car Bunks and Transfer Cars.
Thermostats, Recording Gauges, and the Sidman Special Hygrometers.

For Description and Prices, Write

The Sidmans of Canada

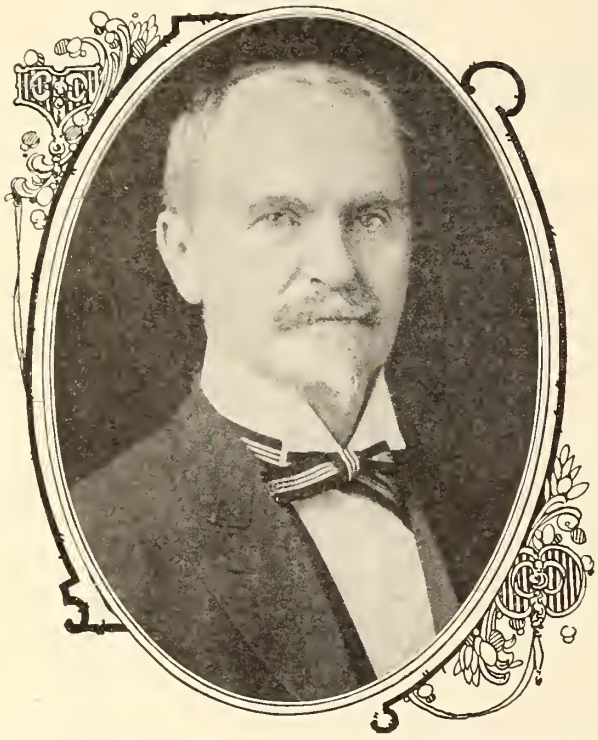
Heating and Ventilating Engineers *and* Lumber Curing Specialists.

LONDON THE S.L.C.K. Reg. Trade Mark **ONTARIO**

Made in Canada

President J. A. Fay & Egan Co., Passes

Announcement has just been received of the death of Thomas P. Egan, aged 74 years, president of J. A. Fay & Egan Co., Cincinnati, Ohio, manufacturers of the "Lightning" Line Woodworking Machinery. Thomas Patrick Egan was a resident of Cincinnati, nearly all his business life. He was born. Nov. 20, 1847, in Limerick, Ireland, and when an infant was brought by his parents to Hamilton, Ontario. As a boy, after leaving school, he was in the employ of dry goods houses in Hamilton and then in Detroit, but when 16 years old his mechanical bent led him to Cincinnati, where he secured a position in a machine shop. After a few months he changed to the firm of



Thos. P. Egan, late president, J. A. Fay & Egan Co., Cincinnati, Ohio.

Steptoe, McFarlan & Co., which at that time was one of the heaviest manufacturers of woodworking machinery in the United States. He remained with them 12 years. Early in his employment with this firm he had the misfortune to lose an arm. Up to that time he had been engaged in the manual processes of the shop, but the accident sent him into the office where he studied bookkeeping and the technique of the business, which started him on his career of inventor, manager and employer.

In 1874 he decided to begin business on his own account and with two partners opened a little shop, where at first the partners constituted the entire force. Seven years afterward, however, in1881, the Egan Co., was incorporated with a capital of $150,000 with Thomas P. Egan, as its president. This enterprise was successful from the first. It was located across the street from the establishment of J.A. Fay & Co., then the most important woodworking machinery establishment in the country, and of which it became a rival. The commercial battle was a warm one, and finally resulted in the consolidation of the two companies in 1893 under the style of the J. A. Fay & Egan Co., of which also Mr. Egan was president. While busily engaged with the multitudinous affairs of his own business, Mr. Egan showed the spirit of a good citizen and was always ready to do his share in any movement for the advancement of the city of his industry or the country.

System Foundation of Economical Production

(Continued from page 94)

given. In the varnishing section the use of movable drying racks have been found of great value in saving time and labor. These racks are fitted with ball bearing castors. In the first instance the racks are taken empty to the spraying machine. The various pieces are sprayed and placed on the racks, where they are left to dry. When a second coat is required, the full racks are wheeled to the machine, sprayed, and again left to dry on the racks. The racks will take bed or toilet frames and buffet backs. Platforms on ball bearing castors are used for drying and conveying dining table tops.

The surface oak furniture is stored in warehouses on the ground floor, while the better class of goods are kept in a store-room, on the second floor. The shipping room and store-room for various supplies are on the ground floor. The former opens right on to a Grand Trunk siding, so that furniture is loaded direct into the cars. On the same floor is a store-room for such small parts as mirror frames, bureau backs, and sideboard backs. A small dry kiln for bending rims to be used in round extension tables is on the ground floor.

The plant is operated by steam. One of the boilers, of 150 h.p., is by the Waterous Engine Works Company, Limited, Brantford, and the other of 90 h.p. by the Jenckes Machine Company, Sherbrooke. The boilers are fed by shavings and refuse, which are collected by means of the exhaust system of Sheldons, Limited, Galt, and conveyed direct to the boilers. The engine is of the Wheelock type, supplied by a Fairbanks-Morse dynamo and a 20 h. p. engine are installed.

The general offices together with the office of the superintendent are on the ground floor.

The superintendent is Albert Hudson, an old contributor to the "Canadian Woodworker and Furniture Manufacturer."

"Play the Game Hard but Play the Game Fair"

(Continued from page 90)

"Good Furniture Magazine," Grand Rapids, Mich., gave an interesting and instructive address on "Publicity."

Upon the conclusion of Mr. Gronberg's address a resolution was passed that the members of the Furniture Manufacturers' Association endorse in principle the publicity campaign carried out by the Home Furnishings Bureau, and promised their moral and financial support to what extent they can possibly give it.

TURNER-FARBER-LOVE COMPANY

MANUFACTURERS

HARDWOOD LUMBER AND SLACK COOPERAGE

SUCCESSORS TO

DARNELL-LOVE LUMBER CO LELAND, MISS.
RUSSE & BURGESS, INC. MEMPHIS, TENN.
LELAND STAVE & LUMBER CO. LELAND & CHICAGO

MEMPHIS, TENNESSEE
U.S.A.

NATIONAL HARDWOOD LUMBER ASSOCIATION

NATIONAL LUMBER EXPORTERS ASSOCIATION MEMBER OF

We beg to announce the amalgamation of the DARNELL LOVE LUMBER COMPANY of LELAND, MISSISSIPPI, the LELAND STAVE & LUMBER COMPANY of LELAND, MISSISSIPPI, and CHICAGO, ILLINOIS, and RUSSE & BURGESS, INCORPORATED, of MEMPHIS, TENNESSEE, under the name of TURNER-FARBER-LOVE COMPANY of MEMPHIS, TENNESSEE.

We wish to thank you for past favors and hope you will favor the TURNER-FARBER-LOVE COMPANY with your patronage.

DARNELL LOVE LUMBER COMPANY
LELAND STAVE & LUMBER COMPANY
RUSSE & BURGESS INCORPORATED

Sole Manufacturers PANTHER BURN Cypress

What of Hardwood Lumber Market?

Will Increase in Demand Mean Higher Prices?—Not Much Tendency Toward Increased Production—Prominent Lumbermen Outline Views

The lumber situation has undergone very little change since the first of the year. The volume of business offering to date may not have come up to the expectation of many hardwood lumber manufacturers who are looking for a marked increase in demand. Prices have shown very little variation, having apparently stabilized at present levels. In certain sections of the south production was pushed in anticipation of a better market. When this did not materialize, slight reductions were made to retard accumulation of stocks. Theseprice movements appeared to have been only local; in fact they are not reflected in the general level of values.

As it stands to-day, the upper grades above No. 2 Common are scarce, while there is an over-abundance of lower-grade stock. Production is low with little, if any, tendency toward higher output. The situation is one which will stand careful watching. When buying once starts, and the demand is bound to increase, prices on the better grades will reflect such renewed activity. The last week or ten days has shown a marked increase in the number of inquiries made and in shipments.

A number of hardwood operators who are in the closest possible touch with the general situation, have outlined their views for the readers of the "Canadian Woodworker and Furniture Manufacturer." These are as follows:—

Canadian Hardwoods

Edward Clark & Sons, Limited Toronto:— In our opinion the hardwood situation in Canada is rapidly improving. The liquidation process has been followed along carefully and there is now very little forced sale, as a consequence the market is much more stable. The weakest point to-day in the hardwood market is a considerable surplus of low grade lumber more particularly in one inch. The improvement in the furniture trade and evidence of a good building season have caused some considerable enquiry for this line of stock. We would say that if prices are maintained on a reasonable basis trade should rapidly improve and we are anticipating a fair year's business.

Ample Stocks of Walnut

Frank Purcell, Walnut Lumber Co., Kansas City, Kansas:—

The recent furniture exhibits at Grand Rapids and Chicago were attended with a fair degree of success, the amount of orders booked by furniture manufacturers being sufficient to insure uninterrupted operation of the factories for a number of months at least. The proporition of furniture sold in American Walnut was large, which would indicate a good consumption of this wood during the first half of 1922.

The prices being secured at this time for the lower grades of walnut are hardly sufficient to encourage a large production, but there is every indication that stabilized conditions would permit a sufficient advance in the lower grades to permit the manufacturer of lumber to secure a fair replacement cost for his production. In anticipation of this, production is being resumed by some of the larger mills, and there seems to be no reason to believe that there will not be an ample supply to permit of the proper selection by the buyers of furniture factories.

So far as this company is individually concerned, we do not find it difficult to dispose of our walnut lumber about as quickly as we have it in good dry condition for the furniture trade.

Northern Hardwoods

Bigelow-Cooper Co., Bay City, Mich:— "The spirit of conservation which has prevailed during the past two years continues to predominate with the consuming trade and therefore, the tendency to wait for the actual need of lumber is retarding sales. The curtailment in production during the last year has reduced stocks, especially in the higher grades to a very low point. These stocks cannot be replenished before the summer months when the new stock cut during the winter becomes dry. It is therefore, very likely that the anticipated demand for high grade hardwood during the next two or three months will cause a severe shortage which of course will affect values. We consider that the buyer who delays his purchases until pressed by his real needs will suffer,"

Stronger Demand for Mahogany

Freiburg Mahogany Co., Cincinnati, Ohio:—There is a tendency at this time for an increase in consumption of Mahogany lumber and veneer and while the process is slow, within the next six months there should be a marked improvement in demand. Prices to-day are very low on Mahogany taking into consideration the cost of logs at this time. There has been an increased cost to the manufacturer of logs for this coming season of at least 20%. There seems to be no doubt but that the prevailing prices will show some improvement.

We are very hopeful for 1922 and anticipate that by April or May conditions will bring sound and prices improved.

Flooring and Flooring Lumber

Seaman, Kent & Co., Limited, Toronto:— The general situation in hardwoods remains practically unchanged. Prices are holding their own with a few revisions upwards or downwards on special items. There is a super-abundance of stock of the lower ends in birch and maple for which a limited demand exists. In the upper grades there is no surplus stock whatever and millmen are disposed to hang on to what they possess unless they can get a fair figure for their holdings. The amount of hardwood taken out during the past winter shows a considerable falling off from a year ago but the consumption is by no means as great, therefore the supply and demand are more equally balanced.

In respect to hardwood flooring, shipments from our various plants since the first of the year have been considerably ahead of the corresponding period of 1921, and the outlook in gradually improving. Much, of course, will depend upon the building situation during the coming summer.

C. A. Spencer, Limited

:: Members National Hardwood Lumber Association ::

Merchants
and
Manufacturers
of

CANADIAN HARDWOODS

Good Stocks Right Grades
Prompt Shipments

Crating of all descriptions

McGILL BUILDING - MONTREAL

African Mahogany

JUST ARRIVED

Choice shipment showing good percentage of Roey Figure. F. A. S. quality, firm texture.

West African Mahogany

This is the first direct shipment we have been able to receive since pre-war days.

Our supply is limited, don't miss some of it.

Phone, Adelaide 148

The Gall Lumber Co., Ltd.

Offices, Dry Kilns & Sorting Yards — Toronto

Come! Let us reason together!

We have several cars of 5/4 No. 2 Common and Better

BASSWOOD

which we wish to move.

For the asking, we would tell you about some nice wide dry 4/4 No. 2 Common and Better

BIRCH

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 203 McGill Bldg.

Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

News of the Trade

The plant of the Independent Last Co., Montreal, was recently damaged by fire.

C. J. Townsend, Toronto, manufacturer and dealer in antique furniture, recently passed away.

Messrs. Baker & Redden, Windsor, N. S., are contemplating the erection of a sash and door factory.

Panels Limited, Southampton, Ont., contemplate installing a "Merit" hot plate re-dryer and a 42-inch planer.

The Bishopric Wall Board Co., Broad St., Ottawa, is erecting an addition to their factory at a cost of $15,000.

J. W. Hodgson, well known carriage manufacturer died recently at his home in Riviere Du Loup, Quebec.

William Finnegan, Belleville, Ont., carriage manufacturer and prominent citizen, died recently in his 65th year.

Warren, Spence, Niagara Falls, Ont., carriage and wagon manufacturer, recently passed away in his 75th year.

Ridpath Cabinet Co., Yonge St., Toronto, manufacturers of Art furniture, recently suffered a fire loss of $15,000.

Robert Stewart, Limited, Guelph, Ont., expect to have their new woodworking plant in operation some time in March.

H. T. Reid and James McLagan, Montreal, recently registered as Reid & McLagan to manufacture and market upholstered goods.

H. H. Marsh, who conducted a planing mill and lumber yard at Grimsby, Ont., recently died in the Hamilton General Hospital.

J. E. Burnett & Son, Alliston, Ont., manufacturers of phonograph cabinets, have called for tenders on their factory equipment.

The National Showcase Co., Limited, 578 Queen St. East, Toronto, are making some alterations and additions to their showroom.

The Hamilton Home Builders Limited, Hamilton, Ont., were recently incorporated to carry on a general contracting business; capital $500,000.

J. B. Mackenzie, woodworker and retail lumber dealer, Georgetown, Ont., has been re-elected chairman of the Board of Education of that town.

Ontario Casket & Supply Co., has been registered at Toronto and will locate at 331 Symington Ave. The partners are J. M. Arnold and W. J. Hubein.

The plant of Leggat & Platt Spring Bed & Mfg. Co., Windsor, Ont., was badly damaged by fire, loss $15,000. The factory will be rebuilt at once.

William McCown, formerly of Clinton, Ont., where he conducted a carriage factory for a number of years, recently died in Toronto in his 88th year.

The General Motors Corporation, Limited, Oshawa, Ont., recently installed a number of Preston woodworking machines in their plant at Oshawa.

The Montreal Wood Mosaic Flooring Co., Limited, 672 St. Catherine St. West, Montreal, is now being conducted by Howard A. Gardiner, as manager.

W. W. Avey, Norwich, Ont., contemplates a planing mill to cost $10,000. A by-law was carried recently granting a fixed assessment on this property.

The Grey Furniture Co., Limited, Neustadt, Ont., have undertaken the production of some new lines of furniture, viz., dining room chairs and library tables.

The Sussex St. woodworking plant of the Gatineau Co., Ottawa, formerly the property of W. C. Edwards & Co., has been closed down for an indefinite period.

W. P. Flint, Chicago, secretary of the Millwork Cost Bureau, was in Toronto recently and addressed a gathering of woodworkers at the King Edward Hotel.

The Canadian Match Co., Limited, Pembroke, Ont., which was incorporated about a year ago with a capital of $1,000,000, recently put their plant in operation.

Fletcher-Reis Brush Co., Limited, Toronto, have been incorporated with a capital of $60,000, and will manufacture brushes, brooms and other wooden products.

The Ontario Sanitary Kabinet Co., Limited, Toronto, were recently incorporated with wide powers to manufacture and deal in wood and iron. Capital $50,000.

Brunette Sawmills, Ltd., including a planing mill at Sapperton, B. C., near New Westminster, were completely destroyed by fire recently at a loss of $500,000.

T. H. Gillespie, Belleville, Ont., prominent citizen, died recently in his 83rd year. Deceased was a carriage maker before retiring from active life a few years ago.

The planing mill and sash and door factory of J. Hanbury & Co., Limited, Vancouver, B. C., which has been shut down for repairs, has been re-opened with a full force.

The H. & E. Furniture Co., Limited, Milverton, Ont., have placed an order with the Paasche Air Brush Co., of Chicago, for one unit of their spray finishing equipment.

Thomas Arnott, Orangeville, Ont., farm implement manufacturer, died recently in his 70th year. Deceased was prominent in public affairs serving as reeve and councillor.

Superior Furniture Co., Ltd., Norwood, Ont., were recently incorporated to manufacture and deal in furniture, toys, baby carriages and other wood products. Capital $40,000.

The St. Mary's Wood Specialty Co., Limited, St. Mary's, Ont., are in the market for 100,000 feet of rock elm logs, also for quantities of white ash, hickory and second-growth maple.

Jackson Cabinet Co., Limited, Durham, Ont., have been recently granted a provincial charter with a capital of $100,000 to manufacture and deal in cabinets and other articles of wood.

Wilson Motor Bodies, Limited, Toronto, have been incorporated to manufacture and deal in automobile bodies, flying boats, water craft and other wooden vehicles. Capital $100,000.

The Kootenay Match Co. is being organized with a capital of $150,000, to engage in the manufacture of matches. Patents on certain special new process machines are held. The registered address is Nelson, B. C.

John Hepner of the firm of Stevens-Hepner, Ltd.,

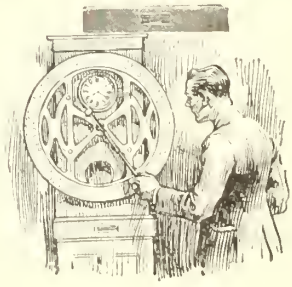
Modern Methods of Producing Furniture must FIRST begin with Modern Methods of Accurately recording the Labor Time you pay for

THIS issue of the Canadian Woodworker and Furniture Manufacturer is featuring modern methods of producing furniture. Up-to-date machinery for quantity and quality production—ideas for eliminating unnecessary operations—proper arrangements of machines and routing of work—and many other useful suggestions are outlined. They all tend toward increased production and lowering of operating costs.

But what about the methods you have adopted for keeping an accurate account of your labor time? Have you given this question the thought and consideration it should have? Labor time represents a large percentage of your manufacturing costs. You know exactly how much to charge up for raw materials—for operating expenses—overhead and depreciation of plant and equipment. Are you as thoroughly organized to say exactly what your labor has cost you? You cannot be absolutely sure unless you have a modern system of time recording.

Job Recorder

Card Recorder



Dial Recorder

INTERNATIONAL TIME RECORDERS and INTERNATIONAL JOB TIME RECORDERS

will give you this information accurately and legibly printed on convenient time sheets and cards, which are always at your disposal for reference. They enable you to estimate the exact cost of your labor and —even more important—they show you the difference between purchased labor and productive labor, a difference which represents a dead loss.

INTERNATIONALS are made in 260 models, either electrically operated or spring driven and adapted to all lines of business. We are the only manufacturers in the world who can offer a choice of every type time recorder—the Dial Type, the Card Type, the Job Type, The Autograph Type, the Self-Contained Type, the Electrically Driven Type.

Time Recorder Prices Are Back to Bed Rock

These reductions range from $10.00 to $85.00, according to style and type of instrument. Effective immediately.

May we show you how we can fill your requirements perfectly?

International Business Machines — SPEED ACCURACY ECONOMY

International Business Machines Co.

LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 29 Dock St. QUEBEC, 506 Merger Bldg MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, Room 8, 36 James St. S. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd. WINNIPEG, 227 McDermott Ave. VANCOUVER, 230 Cambie St. SASKATOON, 254 Third Ave. S.

Also manufacturers of International Dayton Scales and International Electric Tabulators

Port Elgin, Ont., died recently at the Wellesley Hospital, Toronto, in his 73rd year. The deceased was for many years engaged in the manufacture of brushes and brooms.

The Starr Company of Canada, Limited, London, Ont., are at present manufacturing and finishing their phonogarph cabinets in Canada. Formerly the cabinets were imported from the parent organization in the United States.

Thee Wallace Shipbuilding Co., North Vancouver, B. C., were the successful tenderers for repairs and alterations to the "Admiral Farragut." This contract was secured in the face of keen competition from American yards.

Alberts Furniture Co., Limited, Montreal, have been granted a federal charter to manufacture and deal in all kinds of furniture. Capital $250,000. P. Bercovitch and R. L. Calder, both of Montreal, are two of the incorporators.

It is rumored that the Canada Car & Foundry Co., Montreal, who recently turned out 200 cars for the Toronto Transportation Commission is considering the establishing of a plant in Toronto, owing to opportunities offering in that city.

The order for doors for the new Prince Edward Hotel at Windsor, Ont., which is to cost $1,000,000., has been given to the McLean Lumber Co., while Schultz Bros. & Co., Limited, of Brantford, have been given the order for the casings.

R. Chestnut & Sons, Fredericton, N. B., have had plans prepared for a new canoe factory to replace the one recently destroyed by fire, with an attendant loss of $75,000. Prices are wanted on the necessary equipment. New building will be 4 storeys, 100 ft. x 100 ft.

Layton Bros., Limited, Montreal, have been granted a federal charter to manufacture and deal in pianos, phonographs, music cabinets and other musical instruments. Capital $500,000. Two of the incorporators are P. E. Layton and G. Layton, both of Montreal.

Harris Record & Phonograph Co., Inc., Montreal, was recently granted a provincial charter to manufacture and deal in phonographs, cabinets, records and other accessories. Capital $700,000. J. G. Audette and P. L. Garneau, both of Montreal are two of the incorporators.

Canadian Show Case & Manufacturing Co., Ltd., Windsor, Ont., was recently organized to manufacture and deal in show cases, office fixtures and furniture. Capital $40,000. W. B. Craig, Windsor, Ont., and Ira Cohen of Highland Park, Mich., are two of the incorporators.

About 30,000 tons of box shooks have been shipped this year from Vancouver, B. C. to Singapore, and other parts on the other side of the Pacific. The shook business for 1922 looms large as several good sized orders are anticipated as a result of the success of last year's shipments.

The offices of L. L. Brown, B. C. Lumber Commissioner for Eastern Canada, has been moved from 1 Adelaide St. East, to 51 Yonge St. An interesting display of British Columbia forest products, including several rooms in full scale, finished in B. C. woods, will be found at the new location.

The Currie Manufacturing & Lumber Co., Limited, Brandon, Man., recently put in some new equipment and are now manufacturing a complete line of school equipment. A new line is being added in the shape of a patented moveable desk chair which they anticipate will meet with a strong demand.

The Port Hope Veneer & Lumber Co., Port Hope, Ont., are enjoying a very busy season, having plenty of work for their thirty employees. The splendid type of basket turned out by this plant last season, has won for them many new customers and the industry promises to become an important one.

The Bolt-on Sleigh & Carriage Co., Ltd., Winnipeg, Man., were recently incorporated to manufacture and deal in carriages, sleighs and to purchase the patent for a certain attachment for baby carriages. Capital $50,000. G. H. West, and R. N. Buckley, both of Saskatoon, Sask., are two of the incorporators.

O. J. Mitchell, Ingersoll, Ont., inventor and manufacturer of a combination hearse and casket is suing A. B. Grier & Son of London, Ont., for alleged infringement of patent. The inventor declares the London company is making a similar combination hearse and casket and marketing it at a ridiculously low price.

The Hanbury Mfg. Co., Limited, Brantford, Ont., have again put their plant into operation and are manufacturing boxes of all kinds, crates, shooks, cross arms and open sash. A considerable amount of new machinery has been installed and the plant is now up to date in every respect. At the present time about twenty hands are being employed.

F. Moss, Toronto, has been appointed Canadian representative for the Freiberg Mahogany Co., Cincinnati, Ohio. He is also handling a line of veneers made by the Guelph Patent Casket Co., Limited, Scotstown, P. Q. Mr. Moss is well-known to furniture manufacturers in Canada, having been proprietor of the Preston Furniture Co., Limited, for many years.

Harry Horsman, Crescent Rd., Toronto, who of late years has been head of the Nash Motor Sales in Toronto, passed away in his 63rd year. Deceased was at different times connected with several large industries having been manager for fourteen years of Frost & Wood, farm implement manufacturers. Later he was manager of the Dominion Carriage Company, Toronto.

The Imperial Rattan Co., Limited, Stratford, Ont., recently tendered a social evening to employees and their families. Dancing and cards were the order of the evening. An orchestra, composed entirely of employees provided the music. Refreshments were supplied by the Imperial Rattan Co. This is one of a number of social evenings which have been planned for the winter months.

The Government of Alberta is calling for tenders for the following items of furniture for the Technology Institute.—1. Seating equipment for thirty classrooms. 2. Complete library furniture and equipment. 3. Complete equipment for chemical and physical laboratories. 4. General office equipment and furniture. 5. Assembly hall seating equipment. Tenders are to be in on or before March 31st, 1922.

The article, entitled "The Science of Moisture Control," which appeared in the July issue of the "Canadian Woodworker and Furniture Manufacturer" has been reprinted and is now available for distribution. Copies of this article, which dealt with the subject of controlling moisture in lumber and veneers from a new angle, may be secured by writ-

Look for the brand—It's on every board

THE KRAETZER-CURED LUMBER CO.

Your Protection—Our Guarantee

Kraetzer Curing—What It Is

Kraetzer Curing is simply the modern and more efficient application of the treatment of wood relied upon by the artisans of the earlier periods in the construction of their master pieces of cabinet work. Even, now, after the elapse of centuries, we still frequently encounter such pieces in a perfect state of perservation.

This treatment is even more beneficial to Gumwood than to the woods employed in those earlier times. Kraetzer Curing immediately eliminates the sap and gelatinous substance in the wood. It also completely does away with fermentation and the resulting strain and decomposition, which by some is considered a necessary and deterring evil.

Likewise, Kraetzer Curing makes the sap portion of the wood more dependable than the Heart or Red Wood. It can then be used for practically all purposes with equal or greater satisfaction than Red (or Heart) Gum, Birch, Maple or other woods. It is available at materially lower prices.

Send for the Kraetzer-Cured Booklet, and write or wire for quotations.

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

Our Quartered and Plain Red and White Oak, Ask, Hickory, Red Gum and Tupelo is as fine as the highest quality of virgin timber and thorough knowledge of production can produce.

THERE IS NONE BETTER

ing the Forest Products Engineering Co., Chicago.

The Kinnon Lumber Co., Limited, Toronto, was recently incorporated to manufacture and deal in Canadian and imported hardwoods. Offices have been opened at 454 King St. West, Toronto. The principals of this company are George Kinnon, who for many years was associated with the Wm. Laking Lumber Co., and G. D. Martin, of Burk's Falls. The new company have taken over the business recently carried on by George Kinnon.

James C. Miller, Owen Sound, Ont., recently passed away at his home in that city. Mr. Miller, who was in his 70th year, was well-known in the commercial life of Western Ontario, having for 53 years been connected with the woodworking firm of John Harrison & Sons Co., Limited. For the greater part of this time he acted as treasurer. He is survived by his wife and two sons, Victor, of Peace River district, and W. Harrison Miller, of the Phillips Mfg. Co., of Toronto.

Reports from London, England, state that out of three hundred plants manufacturing toys, eighty-two have closed down owing to German competition. An effort is being made by the British manufacturers, through the Safeguarding of Industries Act to secure an imposition of an extra custom duty of 33⅓ per cent ad valorem. The collapse of the exchange, it is held, gave the Germans an unfair advantage as compared with conditions which enabled British manufacturers to successfully compete in pre-war times.

A provincial charter has been granted to P. W. Gardiner & Son, Limited, Galt, Ont., to carry on business as dealers in and manufacturers of all kinds of lumber and wood products, and to carry on business as builders and contractors and to acquire the assets and goodwill of the partnership firm of P. W. Gardiner & Son, now carried on in Galt. The capital stock of the new company is $500,000 and among the incorporators are,—Peter W. Gardiner, James E. Gardiner, Gladstone W. Gardiner and Harold M. Gardiner.

The Canadian Car and Foundry Co., Montreal, held their annual meeting recently, all the old directors were re-elected, Senator Curry occupying the chair. President Butler speaking on trade conditions stated that despite the dull conditions of the times the company was in excellent condition. His outlook for the coming year was hopeful of better business as the transportation companies would have to replace their worn out equipment sooner or later and he thought it would be soon, if the railways were to give the service that was expected of them.

A chair to be known as the "Mrs. E. B. Eddy Chair of Industrial Chemistry," has been founded at McGill University. This was made possible through the bequest in the will of the late Mrs. Eddy. According to the plans for the new chair, the holders of the professorships will devote special attention to wood chemistry as the Eddy family has been concerned largely with forest products in Canada both in the lumbering and manufacturing ends of the industry. The development of the lumber and pulp and paper industries and the necessity for greater conservation of Canadian forest resources, has increased the demand for men trained in this field.

The Knight Mfg. & Lumber Co., Limited, Meaford, Ont., plan on engaging in the manufacture of doors on a more extensive scale. To this end the following equipment has been added:—Power door clamp; roller table cut-off saw; glue jointer, 15 spindle boring machine, two new presses, 44-inch glue spreader and a 12-inch glue spreader. Both the latter machines are run by small motors. In addition to having a new line of fir doors, they propose to go after the veneer door business more strongly. In a letter to the "Canadian Woodworker" they state,—"Our business has doubled in the past six months and we are looking ahead to better things in the spring."

The Cranbrook Sash & Door Co., Limited, Cranbrook, B. C., have completed their main factory building and the machinery is now being installed. The building itself is two storeys, 112 x 60 feet. The boiler room, dry kiln and lumber sheds are yet to be built, but the whole unit is expected to be in operation some time in March. The output will consist principally of sash and doors, the capacity of the plant being 500 sash and 200 doors per day. H. A. McCallum is the general manager, with W. P. Attridge, secretary-treasurer; J. H. Spence, vice-president, and Joseph Woodman, director. From 40 to 60 men will be employed. They expect to make an addition next year in the shape of a box factory to cater to the demand for fruit and butter boxes.

Which Way Do You File Band-saws?

It is a universal practice amongst saw-filers, when filing band-saws by hand, to file the front of a tooth before filing the face of the same tooth, with the object in view of throwing whatever burr there may be parallel with the face. It has been found in actual practice that any burr that may be left in this manner will break off in running in such a way as to leave the cutting edge sharp. Because of this feature, it is not feasible to properly file band saws on any filing machine which employs a pawl to advance the saw, because the file must necessarily cut the face of the tooth parallel with its angular side, and also the front of the tooth above it. As a pawl-fed machine employs the front of a tooth as a stop or rack, by which the saw itself is moved into position, it is obvious that the saw must move in a direction which prevents the file from coming in contact with a tooth after the front of the tooth is filed. In order to overcome this objectionable feature, the relation of the approach of the file and saw to each other, must be reversed; or in other words, if the file maintains its same position, the saw moves in a direction which would require the motive power to be applied against the face or angular side of the tooth. This, of course, is impractical with a pawl, but has been successfully accomplished by the principles employed in the Grip Feed Filing Machine, which was designed after hearing a good many complaints regarding saws filed on pawl-fed machines. The gripping device in this machine clamps rigidly against the side of the blade, and by a cam arrangement may be adjusted to feed uniformly the required length of tooth. The great demand for these machines clearly proves the satisfaction enjoyed by the users of the grip feed filing machine.

Hard work is the best way to take the stretch out of leather belting. Still it is rather expensive if a valuable machine has to be put out of action while a piece has to be taken out of the belt. A good belt which does not stretch has very big advantages.

QUALITY . SERVICE

In Canadian Hardwoods our aim is to supply you just exactly what you want and at the time you want it.

Any kind, any thickness, any grade

The Kinnon Lumber Co., Limited

454 King Street — — Toronto

New and Used Woodworking Machinery

WE CAN SAVE YOU MONEY—Look over our partial list and if you do not see your requirements—Write, Wire or Phone us

60″ Three Drum Sander Berlin.
42″ Three Drum Sander Berlin.
12″ 4-Side Goldie McCullough Moulder.
12″ 4-Side Goldie McCullough Moulder.
7″ 3-Side Cowan & Co. Moulder.
24″ Major Harper Poney Planer.
6″ Single Side C. M. C. Moulder.
24″ Major Harper Poney Planer.
10″ Universal Woodworker McGregor Gourlay.
16″ Buzz Planer.
24″ Power Feed Jointer Preston.
C. M. C. Dowelling Machine 5/8, 3/4 & 1″ Heads.
8′ Cowan & Co. Swing Saw.
36″ Preston Band Saw.
36″ McGregor Gourley Band Saw.
28″ Crescent Band Saw.
20″ Band Saw.
No. 125 Preston Trim & Rip Saw.
No. 127 Preston Trim & Rip Saw.
Roller Top Saw Tables Wood Frame.
Trim & Rip Saws Wood Frame.
Belt Sanders.
24″ Disc & Bob Sander.
6′ Linderman Dovetailer & Glue Jointer.
Knob Cutting Lathe.
42″ Jackson Cochrane Band Rip Saw.
38″ American Veneer Presses.
15 Gal. Glue Cooker.
Chapman Ball Bearing Elevating Floor Truck.
Exhaust Fans.
30″ x 12″ McGregor Gourley Double Surfacer.
15″ McGregor Gourley Planer & Matcher.
24″ Ballentine Planer & Matcher.
Power Feed Rip Saw.
Combination Lath Machine, Green.
Motors & Transmission.

General Machinery Company

67-69 Frederick St., Toronto — TELEPHONE MAIN 2200

Established 1865

J. BERNARD CO.

422-30 E. 53rd St. New York, N. Y.

Manufacturers of

Marqueterie, Borders, Purflings, Lines and Fancy Metal Work

Marqueterie for Furniture, Trays, Cabinets, Chairs, Ship Panels, Pianos, Clocks, Cars, Drawing Rooms and Store. Interiors. Unique Borders in great variety Transformed or Stained Veneers in all colors.
Inlay Lines in Satinwood, Holly, Black, Box, Rosewood, Celluloid, and Brass.

The London Lumber Co. Ltd.

WHOLESALE LUMBER

Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses, Soft & Hard Maple, Ash, and Basswood. Write us for quotations.

487½ Richmond St. London, Ont.

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

WANTED

One Automatic Gauge Lathe with knives. Box 125, Canadian Woodworker, Toronto. 2

WANTED

Mechanical Re-Drier for re-drying Veneer, state size, make and price. Box 127 Canadian Woodworker, Toronto. 2

WANTED

Salesman for Canada familiar with southern hardwood lumber trade either commission or salary basis. Box 126 Canadian Woodworker, Toronto. 2

WANTBD

First class Estimator in small sash and door house who would be willing to go into the office and take charge of sales. First class opportunity for the right kind of a young fellow with lots of pep. Salary, whatever you can produce.

Webster Bros. Mfg. Co.,
2 Waucoma, Iowa.

A Bargain for Some One

We have for sale a 12" Four Side Moulder and Matcher, S. A. Woods, recently overhauled and guaranteed to be in first-class running order. Price very reasonable and can be shipped to any point immediately.

C. Alf. Gingras & Fils, Limitee,
2 Sherbrooke, Que.

FOR SALE

One large size Billstrom Clamping Machine
One Mattison Turning Machine with equipment
One Moore 6' Power Stroke Panel Sander
One Houston 8 x 4-4 sided moulder, complete
One Belt Power Driven Veneer Press 36 x 54"
One Fay Egan Chain Feed Rip Saw (Lightning)

Various sizes three drum Royal Invincible Sanders.

These Machines are all guaranteed in first class condition. Victor J. Reed Esq., Jamestown, New York. 2-3

Used Machinery For Sale

1—No. 152 "Preston" Swing Saw, 9' from centre of saw to base of Hanger, (as good as new).
1—24" "Falls" Undercut Buzz Planer (C.M.C. make,), complete and in good condition.
1—"Major Harper" 2 Spindle Babbitt Bearing Shaper, 24" Spindle Centres, 1-1/8" Spindles, Table 58" x 44", special countershaft, thoroughly overhauled.
1—"Goldie, McCulloch" 2 Spindle Bronze Bearing shaper, 24" Spindle Centres, 1-1/8", Spindles, Table 49" x 35" special countershaft, (Thoroughly overhauled)
1—"Cant, Laidlaw & Co" 2 Spindle, Babbitt Bearing Shaper, Pedestal Type, 19" Spindle Centres, 1-1/16" Spindles, Table 42" x 42", Overhauled
1—"Sidney" Tool Co. (Famous 2 Spindle Babbitt Bearing Shaper, 24" Spindle Centres, 1¼" Spindles, Table 54" x 40", Weight 2650 lbs., Special countershaft, (Overhauled and in good running condition)
1—"McGregor Gourlay" 2 Spindle Babbitt Bearing Shaper, 24" Spindle centres, 1-1/8" Spindles, Table 54" x 40" Special Countershaft, (Overhauled and in good condition)
1—"J. Ballantine & Co." 2 Spindle Babbitt Bearing Shaper, 24" Spindle Centres, 1-1/8" Spindles, Table 54" x 40", Special Countershaft, (Thoroughly Overhauled).
1—"J. Ballantine & Co." 26" x 10" Single Cylinder Surface Planer, Straight Rolls and Chipbreaker, (Thoroughly overhauled).
1—"Hermance" 25" x 8" Double Cylinder Surface Planer, Straight Rolls, (Overhauled).
1—"Major Harper" 24" Planer & Matcher, Complete with Square Top Cylinder and Two Side Heads, (Overhauled and in A1 condition).
1—"Jackson & Cochrane," 36" Single Surface Planer, Straight Rolls and Chipbreaker," (Overhauled).
1—"Cowan & Co." M-171-42" Band Resaw, absolutely as good as new.
1—"Goldie, McCulloch" 2 Spindle Horizontal Boring Machine, 8" Centres, (Overhauled).
1—3 Spindle Horizontal Boring Machine, (Overhauled).
1—"Preston" No. 129 Power Feed Rip Saw, complete, (Overhauled and as good as new).
1—"Yates" No. 257, Power Feed Rip Saw, in first class condition.
1—"Clark & Demill" 10"—4 Sided Moulder, with extra set of Shimer Heads, (Overhauled and in good condition).
1—No. 151—"P. B. Yates" 24" Single Surfacer Planer overhauled and in good running condition.
1—24" "Clark & Demill" Second hand Buzz Planer. Overhauled.
1—"Preston" Single Spindle high speed Ball Bearing Shaper. In absolutely as good condition as new.
1—"Cowan" 24" Pony Planer. complete and in good running condition.
2—18" Swing x 8' Bed "Stevens" Engine Lathes. (As good as new).
1—"McGregor Gourlay" Gap Lathe, 28" Swing at gap x 6' bed (3' centres). (In first class running condition.
1—"Preston" Ball Bearing Electric Sand Riddle, (as good as new).
1—No. 23 "Jardine" Bolt Cutting Machine with opening die head.

Apply

The Preston Woodworking Machinery Company Limited,
2 Preston, Ont.

POSITION VACANT

Salesman desired, with established trade, to handle on commission in Canada a complete line of Reed Chairs and Furniture, and Children's Reed Carriages. Address Box 124 Canadian Woodworker, Toronto, Canada. 1-2

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Band Resaw, Connell & Dengler, 54 and 60".
Band Rip Saw, Yates No. 281
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 44 in. heavy type.
Dowel Machine, Hayes
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.
Jointer, Falls Machine Co., undercut 24 in.,
Jointers, 12", 16" and 24"
Jointer, Diehl Continuuous Feed
Lathe, Back Knife Clement 40 in.
Moulder, Hermance 8 and 10 in., 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 4" and 10", 4 side
Matcher, American No. 229 fast feed hard wood flooring.
Planers, all sizes, single and double
Sander, endless bed 48 in., H. B. Smith.
Sander, Moore Machine Co., belt.
Sanders, Columbia 42", 48" and 60"
Saw, mitre, double end Maddox.

Woodworking Machinery Company of Buffalo, 54 Mechanic St., Buffalo, N.Y.
1 T.f.

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

FOR SALE

Band Resaw, 54" Berlin with 3-5½" saws, $1000.00
Box-Board Printer, one-color, Con. & Deng. 19" x 44" $400.00
Box-Board Printer, two-color, 19" x 44" Hooper Late type, Chain Feed $800.00
Box-Board Squeezer, 40" x 48" Mereen-Johnson automatic $700.00
Corrugated Fastener Driver, Doig 2-head $475.00
Equalizer, Berlin No. 229 automatic, Cap. up to 6' 6" long $675.00
Lock-Corner Cutter, Morgan No. 8, double end, $600.00
Lock-Corner Setting-Up machine, Morgan No. 2, $400.00
Nailing mcahines, all styles, Morgan & Doig—State your wants.
Sander, double-disk, 48" Fischer, all iron $235.00.
Screw Driving machines, Reynolds No. 2, $250.00 Each. (2).
Surfacer, single, 24" x 6" J. A. Fay & Co. Sectional roll, $350.00
Surfacer, double, 30" x 7" Whitney, Sectional roll, $1150.00

Chas. N. Braun Machinery Co.,
2-3 **Fort Wayne, Indiana.**

Buy McLaughlin's Rebuilt Machines and Save Over 100 per cent. in Cost

Boring Machine, Egan, single horiz.
Dovetailer, Fay & Egan, late model, No. 201, 9 spindle.
Knife Grinder, T. T. & B. capacity 42".
Glue Jointer, Buss Automatic, capacity 6' 6".
Glue Jointer, Linderman six foot capacity, complete with one Linderman Rip Saw, fine condition, like new.
Variety Lathe.
Motors, 7-½ and 10 H. P.
Mortiser, Fay & Egan Horiz. Hollow Chisel.
Moulder, Rogers No. 3, 7" three side.
Moulder, American 12" four side outside.
Nailers, 6, 9 and 12 track.
Planer & Matcher or Flooring Machine, 9 x 3".
Pony Plner, 24 x 6" Bental & Margedant.
Cabinet Planer, Buss 30 x 6".
Shapers, double spindle, three in stock.
Sander, Smith 30", three drum, endless bed.
Sanders, Vertical & Horizontal Disk.
Cut-off Saw, Railway, hand and power feed.
Band Resaw, American 42"
Circular Resaw, American & Fay & Egan
Double Circular Saw, Fay & Egan No. 187.
Double End Tenoner, B. & M. 90" capacity.
Veneer Press, sectional, all sizes.
Other machines in stock, send us list of your requirements.

A. A. McLaughlin & Co.
24 West Second Street,
2 Cincinnati, Ohio.

Millwork Manufacturers' Association Meets

Sixty-two members from eleven States attended the quarterly meeting of the Southern Sash, Door & Millwork Manufacturers' Association which opened recently. President P. F. Conway, of Danville, Va., Presided. The feature of the day's session was the address by Secretary C. B. Harman, on "Trade Associations, the Government and the Public."

Tells Value of Association Work

After refuting baseless charges made against trade associations by those not familiar with the workings of such organizations, Mr. Harman proceeded to show the wide variety of constructive work carried on by an association such as that of the southern millwork men. "In reality," said he, "our association is nothing more nor less than a trade institute where we are teaching our members the things necessary for the successful conduct of their business," He enumerated some of these things, as follows:

How to construct their factories and to lay out their plants, wisely, economically and with the latest facilities.

What kind of machines to install, where to buy it, how best to place it and how to keep it in good condition.

When to scrap a machine and how to know when a machine is giving less service or efficiency than some other new type or make of machine.

When it is profitable to buy rather than to make certain material.

How best to keep and arrive at the true cost of buying, storing, handling and selling various kinds of material.

How best to standardize as regards sizes, quality, manufacture, packing and design.

How best to systematize their accounting, conserve stationery and conduct their office affairs by the largest and shortest methods.

When, where and how to advertise, and how to find new fields or wider territory.

How to ascertain whether they are making their material as cheaply as their competitors.

How to find whether their employees are giving them more or less efficiency than those of their competitors and whether their head men, such as superintendents, estimators, sales manager, and others, are as competent and reliable as similar employees of their competitors.

How to know what kind or raw material and supplies are best to use and where to get them.

How to take off lists of material from architects' drawings in the quickest, most correct manner.

How to prepare estimates with least risk of errors, what forms are legal, the most correct and desirable manner of listing, and how to perform this work quickly and in a way that may be plainly understood by everyone.

Mr. Harman also said that the association served as a clearing house for information and counsel along all lines relating to the millwork industry, a service that is extensively and continuously used by manufacturers all over the United States and Canada, both members and nonmembers.

"Restrict organization among manufacturers, limit the activities of trade associations and development will stop, new ideas will be scarce, the business of manufacturing will become sluggish, and the public will have to pay," said Mr. Harman in closing.

Assistant Manager J. L. Thompson, of the fabricated production department, United States Chamber of Commerce, delivered a talk on elimination of unnecessary items as a measure of efficiency and economy. Secretary-Manager J. E. Rhodes, spoke for the Southern Pine Association, pledging its co-operation to the millwork manufacturers in constructive endeavor. H. T. Didesch, of the Millwork Cost Bureau, Chicago, also delivered a talk. .

TO SPAN THE DELAWARE

A salute of 17 guns from the Olympia Admiral Dewey's old flagship, was the signal recently for the opening of the exercises which officially marked the beginning of work on the Delaware River bridge between Philadelphia and Camden, N.J.

The bridge will be one of the longest of the suspension type in the country. The main span will be 1,750 feet long and the total length of the structure will be 1.82 miles. Its cost is estimated at $25,000,000.

FIRES DURING 1921 IN MONTREAL

There were 1,776 outbreaks of fire in the city of Montreal during the year ending December 31, 1921. Of this number Investigator Constantin of the Fire Commissioner's Court found that 558 merited inquiry. This necessitated 1,582 witnesses attending the Fire Commissioner's Court. The causes of 809 fires were established, leaving 967 outbreaks, the origin of which was not determined. It was stated at the Fire Commissioner's Court that 50 per cent. of the fires were due to negligence.

ADDITION TO STEEL PLANT

Notwithstanding that the plants of the corporation are running at only one-third their normal capacity, the board of directors of the Bethlehem Steel corporation voted to appropriate $25,000,000 for the construction of additional works.

This was announced by Charles M Schwab, chairman of the board, in an address before the Hotel Men's Association of New York, recently.

Can You Define Millwork?

Much Confusion Exists with Regard to Use of this Term—Exact Definition Will Remove Point of Friction Between Manufacturer and Purchaser or Architect

How many readers of the "Canada Woodworker" can give an exact definition of what constitutes millwork. The term as used to-day has many applications, and often when a woodworker quotes on the millwork of a certain job there is a certain amount of confusion and even friction between the millwork man and the architect or contractor as to just what should or should not be supplied, because of the broad use of this term. The Southern Sash, Door and Millwork Manufacturers' Association have attempted a definition of millwork, which might well be used as a basis by others when figuring the millwork requirements of a job. The complete definition is as follows:

Millwork is considered to be that portion of wood building materials only, shown and specified for the construction of buildings as is usually made in a sash, door, blind and millwork factory, clearly detailed to scale of not less than 3/4 in. to the foot, and does not include anything in the way of rough or dressed framing lumber, flooring, ceiling, siding, grounds, furring, laths, shingles; no hardware of any nature, except sash pulleys and sash weights and cords for C. R. windows; no composition work of any nature, except column caps, unless forming a part of and attached to some piece of millwork on to which it must be fixed at the shop, nor anything else of any nature not made of dressed finished lumber.

The doors, transoms, side lights, windows, sash, blinds, balusters, columns, brackets, pedestals, newels, mantels, medicine cabinets, and panel wainscoting are furnished, made and put together, but never cut net, nor made to exact fit or exact size, sufficient wood being left to permit of fitting by the contractor or builder at the building. Panel wainscoting usually being furnished in sections.

Frames, jambs, colonades, inside trim, seats, cupboards, sideboards, bookcases, china closets, etc., are always furnished knocked down, except when plainly specified and ordered otherwise.

Inside and outside finish of all kinds and mouldings are always run and furnished in lineal ft. unless plainly specified and ordered otherwise.

Stairs are made and furnished knocked down and as follows unless otherwise agreed and contracted for:

The newels are put together, not housed and left sufficiently long to be cut to proper length by the builder.

The balusters furnished and left sufficiently long to be cut to proper length by the builder.

The strings furnished, housed when so detailed and left a little long for fitting by the builder.

The rail furnished in proper lengths, but not cut exact, being left sufficiently long for fitting by the builder. No rail screws furnished nor no connections made for same.

The crooks, ramps easements and turns are furnished in proper lengths, but not cut exact, being left sufficiently long for fitting by the builder. No rail screws furnished nor no connections made for same.

The treads worked and cut exact sizes and nosing put on when so shown, but never dove-tailed for balusters.

The risers worked and cut to exact size.

The well hole trim and wall base not cut to tread, other trim and moulding furnished in lineal ft.

The wedges and blocks in proper quantity and size.

The panel work as shown in sections, put together, but not cut exact, sufficient wood being left for proper fitting by the builder.

Knock Down (abbreviated KD)

Material made knocked down is understood that all the parts or members are to be worked to detail, or when of stock patterns, are to be worked as shown in our latest adopted catalogue, cut to proper sizes, bundled and marked, except where it is considered best by the shop to furnish in approximate lengths, such as window and door trim, shelving lumber, built-in cupboards, cabinets, outside steps and anything else for which the architects or builder does not furnish the exact net sizes, will always be furnished in approximate lengths to permit the builder to cut exact.

Measurements and Details

It being always understood that the builder or architect will furnish exact sizes and proper details. Should the factory be called upon to take measurements from the building or to furnish details for approval of the architect, or builder, a charge of $10 per day per man will be assessed, plus hotel bill and traveling expenses both ways.

Window and Door Trim

Inside trim for a window consist of any or all of the following as shown on details. Stool, apron, side and head eastings, inside stops, corner blocks, head blocks, jamb lining or extension jambs, cap mould, hoods, back band. (The head caps and hoods always KD).

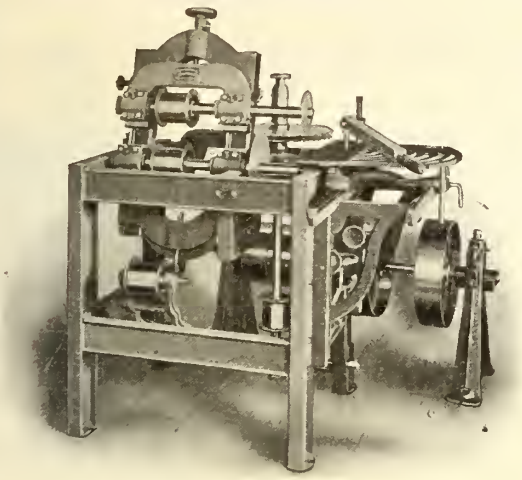
When outside frames are furnished and the inside trim is not included, the frames do not carry the inside sash stop, as it is contemplated that the sash stop must match the other members of the inside trim.

Thresholds or carpet strip go with the inside door jambs or frames, as they are included in our catalog list prices for same.

McLaurin-Jones Co. Organized

The Ideal Coated Paper Co., Brookfield, Mass., announce that their organization has amalgamated with Samual Jones & Co., Newark, N. J., and the Ware Coated Paper Co., Ware, Mass., into one corporation known as the McLaurin-Jones Co. The new company is in a position to supply a wider range of gummed and coated papers, ceiling tapes and other kinds of paper.

The disadvantage of a universal woodworker is the crowding together of too many machines. It would be wiser to cut out one or two machines and give more room to the others.



No. 19 Saw Tenoner
No. 20 Large Saw Tenoner

Fitted with five saws, has replaced cutter head machines; for all jointing and halving in wood shops and for automobile and carriage wood-work it is the best machine on the market.

Much door, window, sash, furniture and cabinet work is done with this machine where a nice, smooth tenon is required. It is also used for the halving and jointing of stock at any angle.

Tenoners equipped with flexible coupling for direct motor drive or for countershaft.

No. 19 Small Saw Tenoner
No. 20 Large Saw Tenoner
No. 21 Regular Bevel Saw
No. 22 Large Bevel Saw
No. 23 8½" Irregular Dresser
No. 24 6" Irregular Dresser
We also manufacture metal working machines.

Write for catalogue.

Pettingell Machine Co.
Amesbury, Mass.
Mention Canadian Woodworker.

NARROW BAND SAWS AND MACHINES FOR THEIR CARE

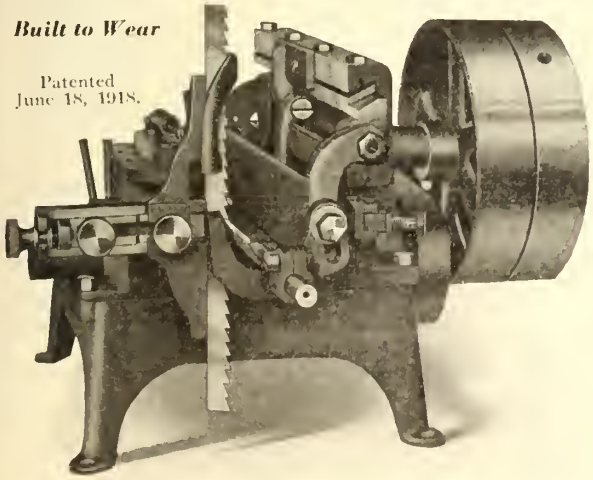
Our narrow band saws are made of the best Swedish steel and sharpened on the "Grip Feed" Filing Machine the latter of the most advanced design and construction. We specialize in these two items alone, with many years' experience back of us as our qualification to furnish as good a narrow band saw as there is on the market, together with the latest development in a saw-filing machine for the care of band saws.

Send us your next order for narrow bands, also ask for particulars of the "Grip Feed" Filing Machine.

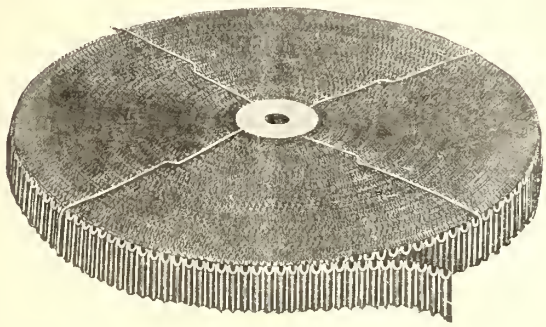
American Saw Filing Machine Co.
36 Washington St., N. Boston 14, Mass.

Built to Wear

Patented
June 18, 1918.

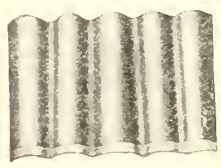


Cary's Corrugated Fasteners



Saw Edge

Saw Edge



Plain Edge

We are sole owners of patents, process and machines for manufacturing a **Saw Edge Corrugated Fastener** with a **Continuous Cutting Edge.** Our fasteners are made in various widths and corrugations, also in coils wound right and left for machine driving. Samples upon request.

After trying our fasteners you will use no other.

Cary Manufacturing Co.
Brooklyn, New York

The Peter Hay Knife Co., Ltd.

Manufacture the Best

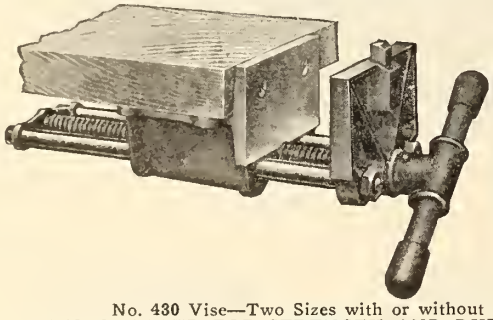
PLANER KNIVES and CUTTERS

OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited

GALT, ONTARIO

Quick as a Cat - A Hold like a Bull Dog



No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

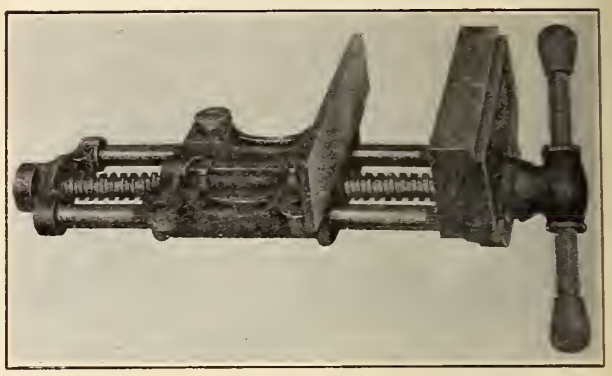
No. 430 Vise—Two Sizes with or without stop

UNEQUALLED FOR STRENGTH AND DURABILITY

Our Complete Catalogue on Request

RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.

The Vise You Swear BY not AT



On the Market for 15 years.

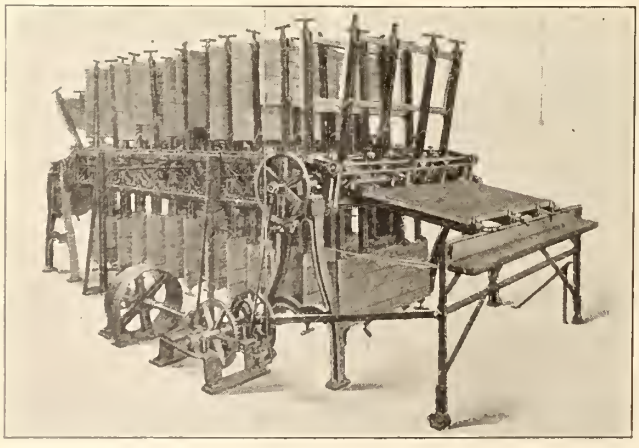
Globe Vise & Truck Co.

GRAND RAPIDS, MICH.

We also manufacture a complete line of steel trucks particularly for wood working factories. The body of our truck is absolutely indestructible, and there are no nails nor screws in the top to mar material, whether finished or unfinished. The roller bearing feature in the wheels allows for much easier handling than the old style plain wheels on the wood truck. In fact one man can handle much more material than on the old style. The price is very little more than that of the old style wood trucks.

One Man Does the Work of Two

with a Billstrom Glue Clamp Carrier



For every plant where much edge-gluing is done there is a real need for a Billstrom.

Here's why.—

The empty clamp is held at just the right height for the greatest convenience of the workman.

When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.

One man can accomplish as much by using it as two men can do employing the old methods.

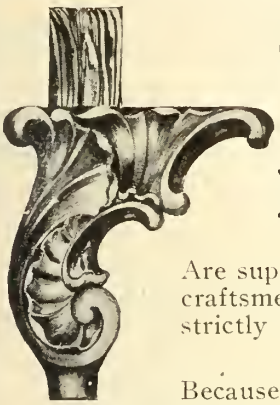
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.

It reduces the labor and cost of edge gluing to the minimum.

There is a size to suit your particular requirements.

N. J. BILLSTROM

2002 NINTH ST. ROCKFORD, ILL.



OVERTON

FINE

Leg Carvings

Are superbly designed by leading craftsmen. The workmanship is strictly high grade.

Because we have a staff of skilled workers and the most improved machinery, we are able to turn out excellent workmanship in large quantities on short notice.

Our designing department is at your service We will reproduce your own designs with perfect fidelity.

Write for full information.

S.E. OVERTON CO.
"Our Quality Is Always Higher Than Our Price"
ARTISTIC WOOD CARVINGS

South Haven, Michigan, U.S.A.

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY

17 State Street NEW YORK CITY

NEW and USED

Ironworking — Woodworking

MACHINERY

AND

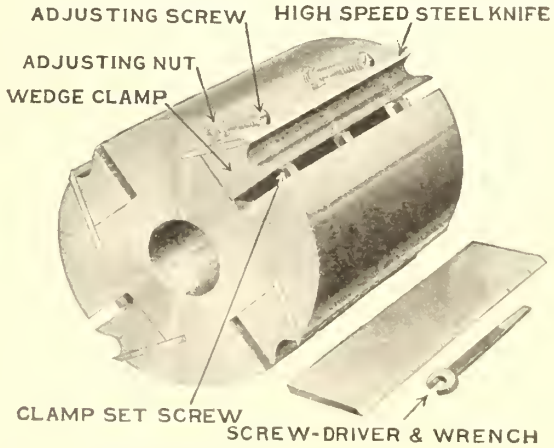
SUPPLIES

ASK FOR OUR NEW STOCK LIST

H. W. Petrie, Limited

131—147 Front Street West

Toronto



The PORTER "C" Slip-on-Head for Shapers, Jointers and Moulders will cut straight or cross grain without tearing. Irregular shaped knives can be used as well.

There are over 3,000 of these Heads in daily use.

Write for circular and quotation.

C. O. Porter Machinery Co.

GRAND RAPIDS, MICHIGAN, U.S.A.

OAKEY'S

Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in , 42 in. and 48 in., wide

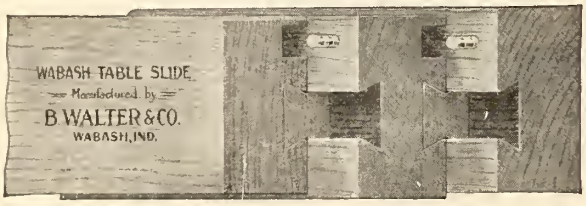
SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

JOHN OAKEY & SONS LTD., WELLINGTON EMERY AND BLACK LEAD MILLS LONDON, S. E. 1.

Canadian Agents:

F. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

THE SLIDE IS THE HEART OF YOUR EXTENSION TABLE



If the Slide Does Not Work properly Your Whole Table is Condemned

Wabash Slides insure Satisfied Customers

SLIDE MAKING is a SPECIALTY BUSINESS

We can Furnish Better Slides for Less Cost

Eliminate Slide Troubles by using WABASH SLIDES

MADE BY

B. Walter & Company

Edsall St., Wabash, Ind.

"The Phillips Line"

Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

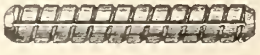
F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

Atlas Mfg. Co. of Orlando
Orlando, Fla., U. S. A.

Dowels, Turnings, Knobs, Spindles, Buttons, Drawer Stops, Table Pins, Screwhole Plugs. Special Woodwork to order.



No 2 Dowel Pin

HENRY ROWE MFG. COMPANY NEWAYGO, Mich.

NAILS AND WIRE

For Every Need in the Woodworking Industry

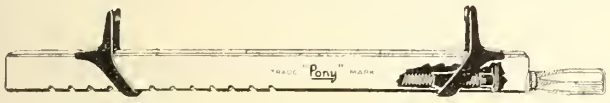
Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

Laidlaw Bale-Tie Co., Ltd.

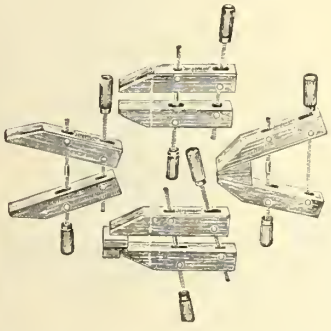
A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que
Harry F. Moulden & Sons, Winnipeg, Man
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.

Head Office and Works: HAMILTON, CANADA

"Pony" Cabinet Clamp



For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.



"Jorgensen"

Peerless Adjustable Hand Clamp

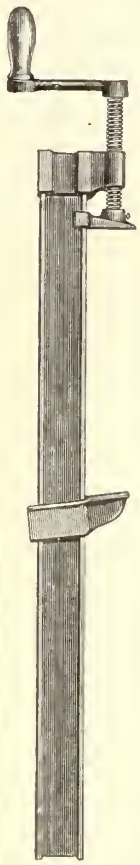
Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

For Sale By

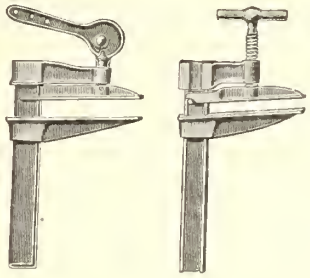
Aikenhead Hardware Limited ..... Toronto
Caverhill Learmont Co. ..... Montreal
Lewis Bros., Limited ..... Montreal



Colt's Clamps

for the

Woodworker



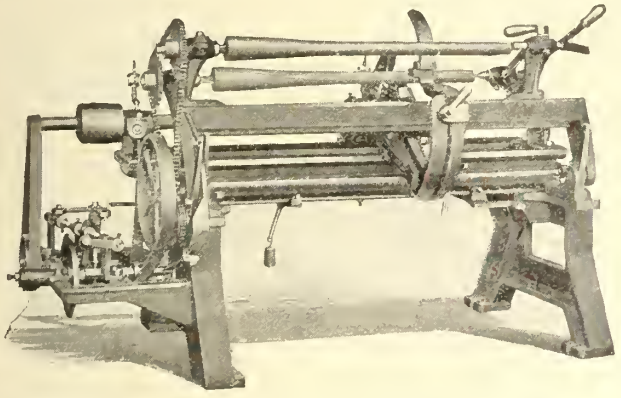
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



Wood Turning Machinery

for making Handles, Spokes, Ball-Bats, Spindles, Table Legs, Chair Legs, Whiffletrees, Neck Yokes, Etc.

ALSO SANDERS, RIP SAWS, CUT OFF SAWS, ETC.

Our machines are
SIMPLE, STRONG, DURABLE

Write for free catalogue No. 31

THE OBER MFG. CO.

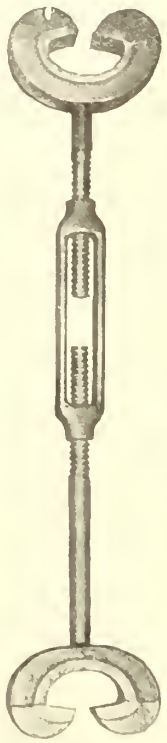
CHAGRIN FALLS, O., U.S.A.

Better work follows the use of the "Empire"

There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

Get in touch with us now. We can make prompt delivery from stock.

We specialize in all types of woodworking tools.



Empire Tool Works

Toronto - Ontario

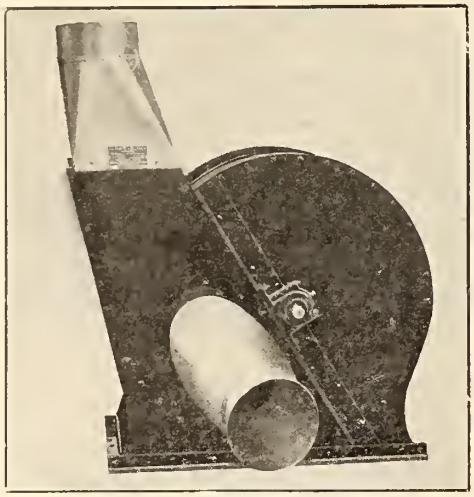
Prevention is Protection

Minimize the Risk of Fire

by

Freeing Your Factory of Inflammable Materials

and Feeding Same Under Boilers with our Automatic Furnace Feeders



Patented
Side view of 30 inch blower showing inlet and upright discharge duct.

The "Foster" Fan is the only non-centre suction fan in existence having a segmental opening to the rear and under side immediately adjacent to the discharge duct, which allows the material entering the fan to be discharged without passing through or around the wheel.

We manufacture Blowers and Blower Systems complete and supply capable and efficient mechanics to install them most scientifically, and will send an expert engineer of extended experience to estimate on cost of installation of Exhaust Systems.

We can supply you with testimonials from Canada's largest manufacturers.

Heavy sheet iron work a specialty.

TORONTO BLOWER CO.

156 Duke Street - TORONTO

BLACK BROS.

CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

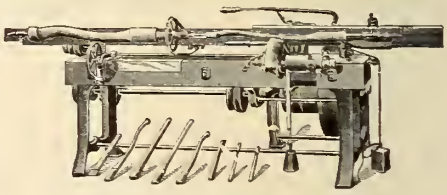
Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A.

Klotz Machine Co's

Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick, Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.

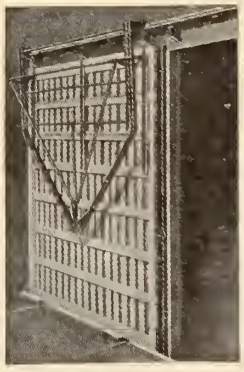
We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY

Klotz Machine Co., Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN DOOR CARRIER CO.

1117 Cornell Ave.
INDIANAPOLIS, IND.

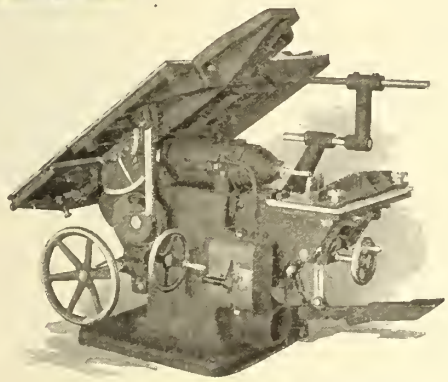
HYDRAULIC VENEER PRESSES
AND
LUMBER ELEVATORS

Write for Explanation of our Most Efficient Veneer Package Handling System

E. B. VAN ATTA & CO., INC.
OLEAN, N. Y.

New York City Office: 50 Church St. **Chicago Representative: Fader Machinery Company, 549 Washington Boulevard**

OLIVER



Oliver No. 80 Precision Saw Bench

This Motor-on-arbor-Saw Bench is the "last word" in saw bench design and construction. It is built with or without mortising and boring attachment, with plain or patent ball-bearing sliding table section.

Full details upon request.

"OLIVER" WOODWORKING MACHINERY
Is Known The World-Over For Its Quality

OLIVER MACHINERY CO.
Grand Rapids, Mich., U. S. A.

The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5.000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

Automatic Hole-Cutting Machines

The Wheel and Hole Cutting Machine has four automatic movements, all of which work in perfect unison, performing their functions in clock-like regularity.

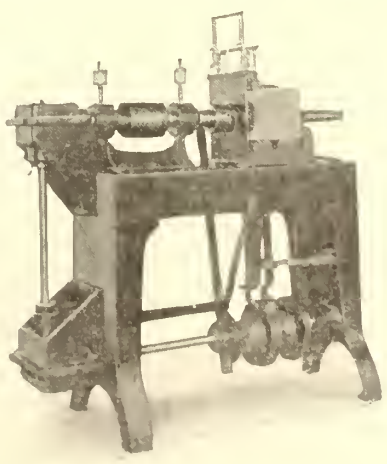
The Hand-Hole Machine will cut hand holes in crate and box ends. It is worked by a carriage and levers, and will cut any size or length hole with either round or bevel edge in any kind of wood.

WRITE FOR NEW DESCRIPTIVE CATALOGUE.

The Virginia Wheel & Hole Sawing Machine Company

S. S. SEE, Manager

14 Third Street N.E. Roanoke, Va.



The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Co., Chicago, Ill.

AROMATIC RED CEDAR
Earthman Lumber Co., Murfreesboro, Tenn.

AUTOMATIC HOLE-CUTTING MACHINE
Virginia Wheel and Hole Sawing Machine Co., Roanoke, Va.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARINGS
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, Que.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P.B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

BELTING
Chicago Rawhide Mfg. Co., Toronto.
McLaren, Ltd., D. K., Montreal, Que.
Dunlop Tire & Rubber Goods Co., Toronto, Ont.

B. C. FOREST PRODUCTS
B. C. Lumber Commissioner, Toronto, Ont.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner Mass.
Williams Machinery Co., A. R., Toronto, Ont

BLOWERS
Canadian Blower & Forge Co., Kitchener, Ont
Toronto Blower Co., Toronto, Ont.
B. F. Sturtevant Co. of Can. Ltd., Galt, Ont.

BLOW PIPING
Canadian Blower & Forge Co., Kitchener, Ont.
Neville Cooper Co., Toronto.

BOILERS
Engineering & Machine Works, St. Catharines, Ont.

BORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Son Co., L. G., Gardner, Mass.
Nash, J. M., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company. Preston, Ont.
Reynolds Machine Co., Massillon, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont
Valley City Machine, Works, Grand Rapids, Mich.
Bell Machine Co., Oshkosh, Wis.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.
Cary Mfg. Co., Brooklyn, N.Y.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont
Mereen Johnson Machine Co., Minneapolis, Minn.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

BUTTONS
Rowe Mfg. Co., Newaygo, Mich.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.

CASTERS
Foster, Merriam Co., Merriden, Conn.
National Hardware Co., Orillia, Ont.
Faultless Caster Co., Evansville, Ind.

CHAIR MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C., Indianapolis, Ind.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
McKnight & Son Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company, Preston, Ont.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.
Bell Machine Co., Oshkosh, Wis.

CLAMP CARRIERS
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.

CRATING LUMBER
Lloyd, W. Y., Toronto, Ont.
Colborn, C. B., Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D., Guelph, Ont.

CUT-OFF SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOOR AND BLIND MACHINERY
Bell Machine Co., Oshkosh, Wis.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind
Richards-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont
Williams Machinery Co., A. R., Toronto, Ont.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.
W. S. Hawker Mfg. Co., Dayton, Ohio.
Bell Machine Co., Oshkosh, Wis.

DOWELS
Canada Wood Specialty Co., Ltd., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.

DRIERS(Hot Plate)
Merritt Eng & Sales Co., Lockport, N.Y.

DRIERS (Veneer)
Merritt Eng & Sales Co., Lockport, N.Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont
Grand Rapids Veneer Works, Grand Rapids Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

DOOR AND BLINDMACHINERY
Bell Machine Co., Oshkosh, Wis.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

EDGER SAWS
Atkins & Co., E. C., Hamilton, Ont.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont
Garlock Machinery Ltd., Toronto, Ont.

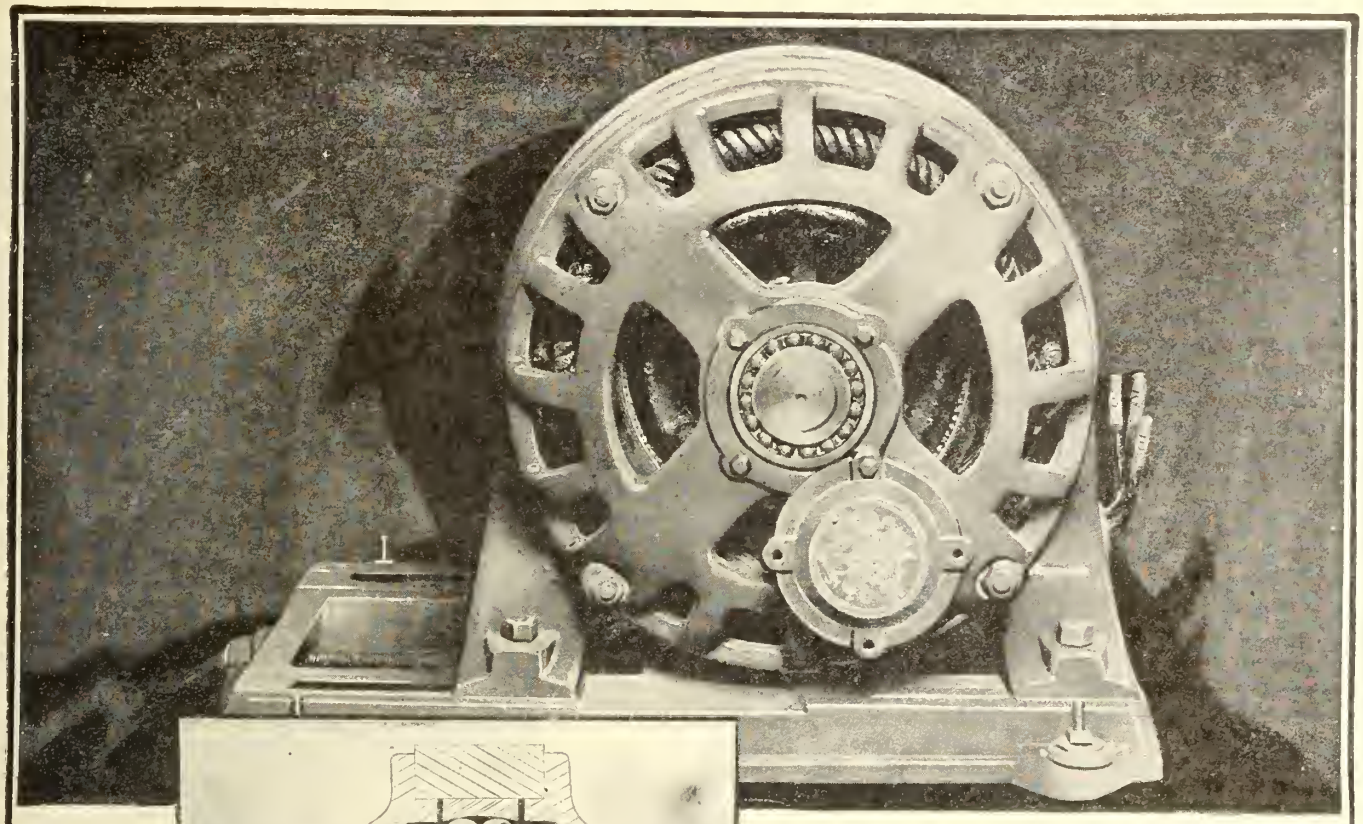
EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.
B. F. Sturtevant Co. of Can. Ltd., Galt, Ont.
Toronto Blower Co., Toronto, Ont.

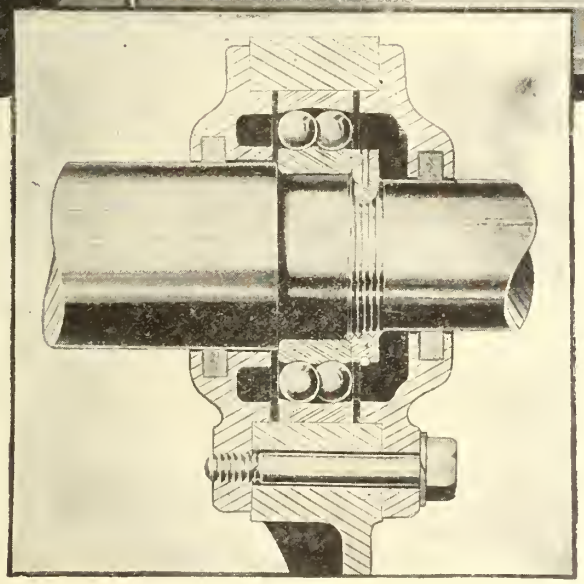
FEED ROLLS
Atkins & Co., E. C., Hamilton, Ont.

FINISHING PRODUCTS
Campbell Co., M. L., Kansas City, Mo.
Flint Varnish & Color Works, Toronto, Ont.

FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.





The twenty-horse-power induction motor with end cap removed showing the self-aligning ball bearing. Note that the ball bearings are contained within simply constructed bearing head brackets with liberal lubricant chambers, which are sealed on both sides by end caps. These end caps are fitted close to the motor shaft and are practically proof against leakage of lubricant, as well as the intrusion of moisture, dust, lint, grit and other foreign substances from without.

The use of ball bearings in electrical machines—

has been a continuous growth and is fast coming to be considered vital to the best mechanical practice in the design of electrical machinery. So marked is this fact that today the leading manufacturers of electrical machinery have a standard line of ball bearing motors.

Self-aligning ball bearings marked SKF are particularly adapted for motor uses and are so nearly frictionless that wear is practically eliminated. This insures perfect rotor alignment almost indefinitely with a constant high efficiency air gap for maximum motor life. And because they are wear-free, the bearings run cool and require a minimum of lubrication and attention.

The engineering experience of our organization is at your disposal. You are urged to submit your bearing problems to us for careful and impartial consideration.

CANADIAN SKF COMPANY, LIMITED

TORONTO - - MONTREAL

C-13

623

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

FANCY METAL WORK
Bernard Co., J. New York City

FASTENERS
Cary Mfg. Co., Brooklyn, N. Y.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.

FURNITURE HARDWARE
Faultless Caster Co., Evansville, Ind.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GEARS
Hamilton Gear & Machine Co., Toronto, Ont.

GLUE
Coignet Chemical Products Co., New York N.Y.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

GLUE CLAMP CARRIERS
Nels J. Billstorm, Rockford, Ill.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.
Bell Machine Co., Oshkosh, Wis.

GLUE ROOM EQUIPMENT
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Stockbridge Machine Co., Worcester, Mass.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
Aberdeen Lumber Co., Pittsburg, Pa.
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Rush Lumber Co., Memphis, Tenn.
Thomas & Proetz Lumber Co., St. Louis Mo.
Turner-Farber-Love Lumber Co., Leland, Miss.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Bell Machine Co., Oshkosh, Wis.

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.
Faultless Caster Co., Evansville, Ind.

HARDWOOD DIMENSION STOCKS
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson, Shreiner & Mawson, Toronto, Ont.
Anderson-Tully Co., Memphis, Tenn.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Robert, Toronto, Ont.
Clark, Edward & Son Ltd., Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree Ark.
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Turner-Faber-Love Lumber Co., Leland, Miss.
Dudley Lumber Co. Inc., Memphis, Tenn.
Frye Lumber & Veneer Co., J. W., Dayton, O.
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La
Hall Bros. Ltd., Toronto, Ont.
Hafner Manufacturing Co., St. Louis, Mo.
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co. Toronto, Ont.
Kinnon Lumber Co., Ltd., Toronto, Ont.
Kellogg Lumber Co. Memphis, Tenn.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Leach & Co., J. D., Chicago, Ill.
London Lumber Co. Ltd. London, Ont.
Long-Bell Lumber Co. Kansas City, Mo.
Liverpool Hardwood Co., New York.
London Lumber Co., London, Ont.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont
Pickrel Walnut Co., St. Louis, Mo.
Richards Hardwood Co., Memphis, Tenn.
Rush Lumber Co., Memphis, Tenn.
Spencer, C. A., Montreal, Que.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn
Stimson & Co., J. V., Owensboro, Ky.
Tennessee Lumber & Coal Co., Cincinnati Ohio.
Thomas & Proetz Lumber Co., St. Louis Mo.
Vail Cooperage Co., Fort Wayne, Ind.
Whiting Co., Wm. S., Johnson City, Tenn.
Wisconsin Lumber Co., Chicago, Ill.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.
Van Atta & Co., E. B., Olean, N. Y.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Smith, C. W. Grand Rapids, Mich.

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J

LACQUER ENAMELS
Celluloid Zapon Co. Wilmington, Del.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co. Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

MARQUETERIE
Bernard Co., J. New York City

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.
Yates Machine Co., P.B. Hamilton, Ont.

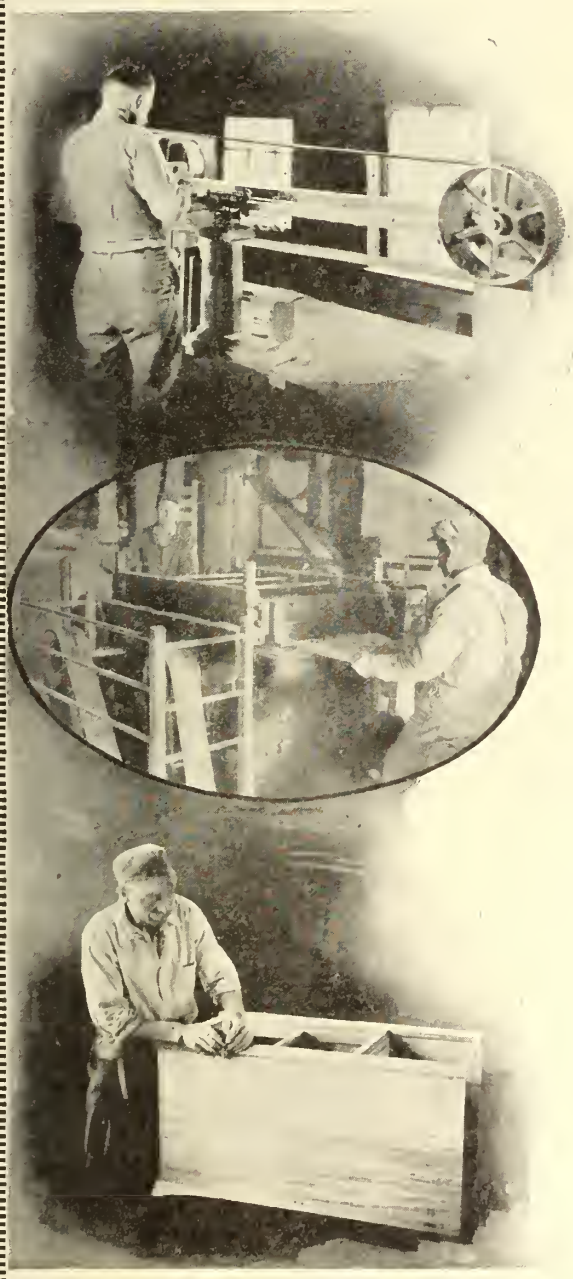
OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PANELS
Algoma Panel Co., Algoma, Wis.
Calhoun Plywood Co., Sheboygan, Wis.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

Three Operators With But a Single Thought—

The Efficiency Of Carborundum Brand Garnet Products



HERE are three men doing three widely varied sanding jobs and doing them mighty well.

One is sanding gumwood boxes for toy blocks. He takes 1/64 off the four sides sanding 1,000 boxes complete with one Carborundum Brand Garnet Belt.

He says he never had a belt to do the work so well.

Another is sanding washing machine bottoms on a drum sander. His comment was that "Carborundum Brand Garnet stands up better—does more work, lasts longer. We have no kick of any kind."

And then we have the hand sanding of phonograph cabinets. The operator here says that he gets a cleaner, more uniform finish, the paper doesn't crack or peel and it's fast cutting and extremely flexible.

Carborundum Brand Garnet Products
Make Good Sanders Better Sanders

The Carborundum Company

Niagara Falls, New York, U.S.A.

New York, Chicago, Boston, Philadelphia, Cleveland, Cincinnati, Pittsburgh, Grand Rapids, Milwaukee, Detroit. The Carborundum Company, Ltd., Manchester, Eng.

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Calhoun Plywood Co., Sheboygan, Wis.
Wisconsin Veneer Co., Rhinelander, Wis.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Smith, C. W. Grand Rapids, Mich.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Smith, C. W. Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co., Herman, Brooklyn, N.Y.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R,, Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SASH
Bell Machine Co., Oshkosh, Wis.

SATINWOOD
Willey Co. C. L. Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P.B. Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D. Guelph, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock Machinery Ltd., Toronto, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Chatham Malleable & Steel Mfg. Co. Chatham, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Bell Machine Co. Oshkosh, Wis.

SAW FILING MACHINERY
American Saw Filing Machine Co. Boston, Mass.

SAW TENONERS
Pettingell Machine Co. Amesburp, Mass.

STEEL DOOR MATS
Cary Mfg. Co. Brooklyn, N. Y.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont

TABLE SLIDES
Bruce Woodworkers Ltd. Chesley, Ont.
Walter & Company, B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.

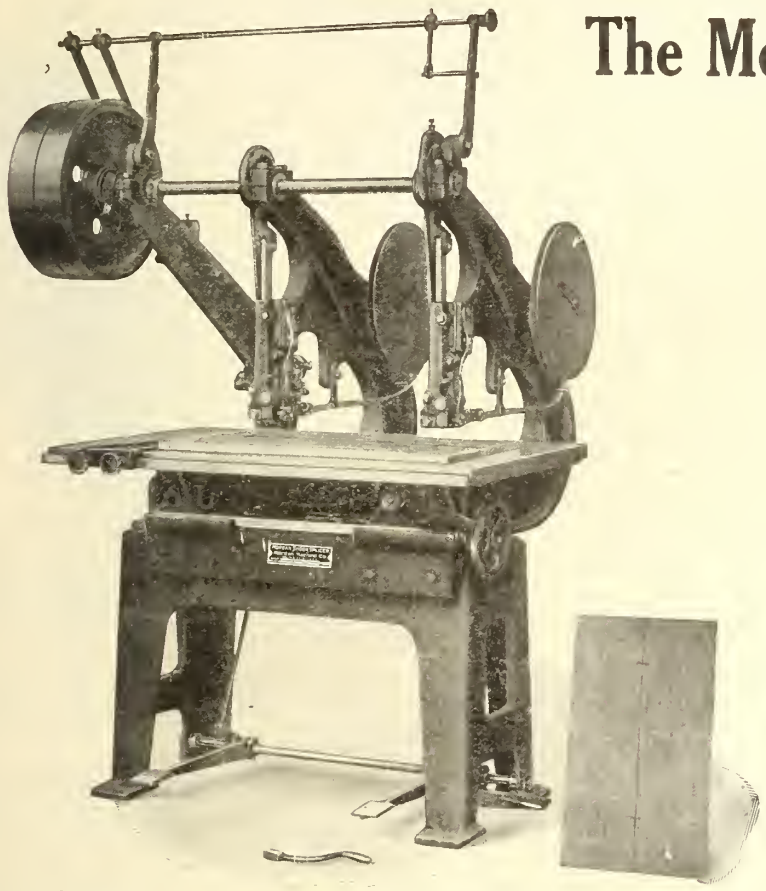
TRIMMERS
Arbuthnot Lumber Sash & Door Co., Vancouver, B.C.
Canada Machinery Corporation, Galt, Ont
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.
Shantz, P E., Preston, Ont.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.
Walter & Sons, J. Kitchener, Ont.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

THREAD CUTTING MACHINES
Smith, C. W. Grand Rapids, Mich.

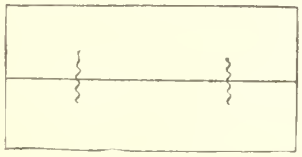


The Morgan Shook Splicer

uses narrow stock

It automatically feeds, cuts and drives corrugated fasteners. Adjustable—handles fasteners from 1/4" to 7/8" in width and from 3/4" to 1 1/4" in length.

Speed, Accuracy, Economy



We manufacture Matchers, Printers and Nailing Machines.

WE INVITE YOUR INQUIRY

Morgan Machine Co.
Rochester, N. Y.

Is it economical ?

Is it the right type ?

Is it the right size ?

THREE GUESSES

Electric power, heating, lighting and equipment problems are to be found in the lumbering and woodworking industries.

Perhaps your output can be increased? You are, perhaps, losing electrical energy by wasteful types of motors? Are your switches and wiring devices up-to-date or are you in continual danger of fire?

We shall be pleased to answer any questions or help you with any problems whenever you care to write us.

Electrical News

Engineering Contracting — Merchandising Transportation

The National Authority

Toronto, 849 West Adelaide Street; Winnipeg, Travellers' Building; Vancouver, Winch Building.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Ault & Wiborg Company, Toronto. Ont.
Flint Varnish & Color Works, Toronto, Ont.
Celluloid Zapon Co., Wilmington, Del.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Northwestern Cooperage & Lumber Co., Glad stone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Wisconsin Veneer Co., Rhinelander, Wis.
Wood Mosaic Co., Louisville, Ky.
Willey Co. C. L. Chicago, Ill.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company. Kitchener, Ont
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm R., Toronto, Ont.
Van Atta & Co., E. B., Olean, N. Y.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.
Flint Varnish & Color Works, Toronto, Ont.
Celluloid Zapon Co. Wilmington, Del.

WOODWORKING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Chatham Malleable & Steel Mfg. Co. Chatham, Ont.
Elliot Machinery Co. Belleville, Ont.
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids. Mich.
Smith, C. W. Grand Rapids, Mich.

WOOD TURNING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Elliott Machinery Co., Belleville, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P.B. Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

WIRE BOX STRAPPING
Cary Mfg. Co. Brooklyn, N. Y.

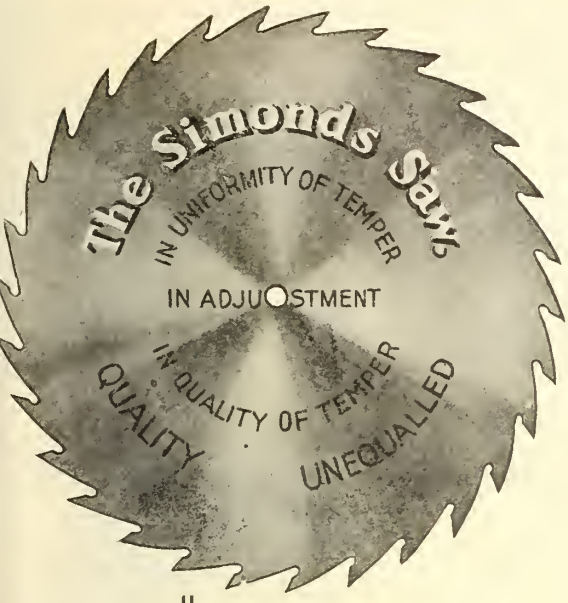
We help you cut down production costs

No woodworking plant can get along without power. It is in the Boiler room that lower production costs must start. Put in new Boilers—the modern, efficient kind we build—and you will make money savings in fuel and operating expenses that will surprise you. Our prices are invitingly low to-day.

Engineering and Machine Works of Canada, Limited

St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal



SIMONDS
CIRCULAR AND BAND
SAWS

In every mill or woodworking shop in the land the demand for greater production is urgent. Devious methods to secure the desired results are being tried out. Some are making good—some are not. They have the manpower, but they can't get production. Many mills and woodworking shops have discovered one of the greatest hindrances to efficient operation are poor saws and knives. The saws dull easily and do not hold their tension, while the knives lose their cutting-edge quickly and this results in unsightly marks on the lumber, and consequently damage.

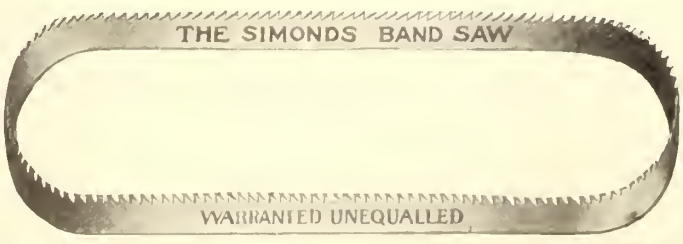
Inferior saws and knives are being discarded by many, and in most cases Simonds Products are replacing them. There is no question about Simonds Saws and Knives They are made of the finest steel obtainable, hardened and tempered right and make mechanically perfect. They produce smooth lumber and cut down your operating expense.

Write for catalog and prices.

Simonds Canada Saw Co., Limited

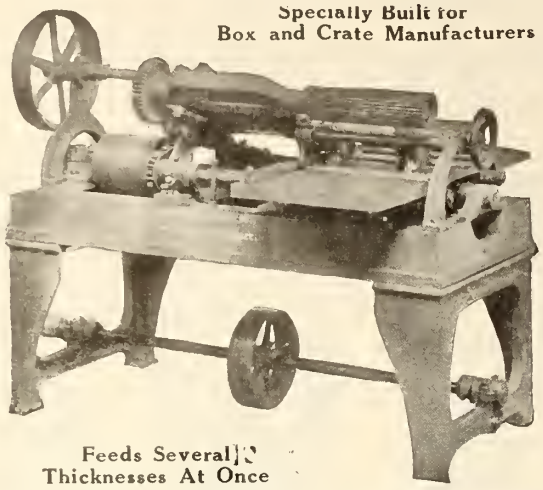
"The Saw Makers"

MONTREAL, Que.
VANCOUVER, B.C. ST. JOHN, N.B



"The Chattanooga" — Just Another Name For Fast, Economical Gang Ripsawing

Specially Built for Box and Crate Manufacturers



Feeds Several Thicknesses At Once

This latest improved gang ripsaw is powerful, fast, safe and eliminates wastage. For gang sawing boards into strips or head sticks and for ripping veneers it is unsurpassed.

Has powerful feed and securely holds down and feeds short pieces. The feed rolls are automatically adjustable to varying thicknesses. Upper rolls are driven by cut gears, and the lower ones by sprocket chain. Several thicknesses of veneering can be fed thru machine at one time.

The CHATTANOOGA is an unusually big producer, easily operated, and turns to profitable account short stuff lying around a mill—otherwise wasted.

Attractive price. Complete information on request

Chattanooga Machinery Company
Chattanooga, Tenn.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.

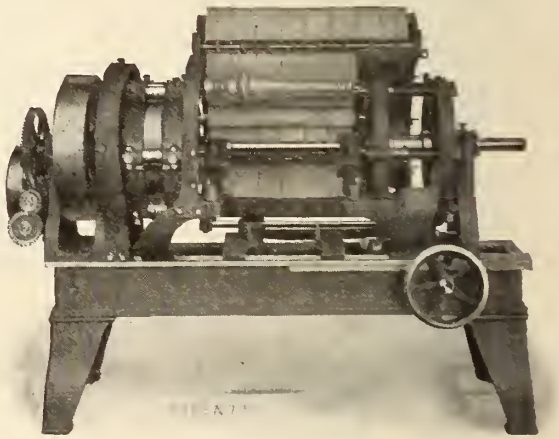
To **Woodworkers and Furniture Manufacturers**

Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

We are always pleased to quote prices and give any information you may desire. Try us on your next order.

THE
Brantford Pattern Works
BRANTFORD

DO YOU KNOW



what it is costing you to sand your furniture and chair turnings by hand rather than on a Nash Sander?

If you don't it is high time you gave this matter serious thought.

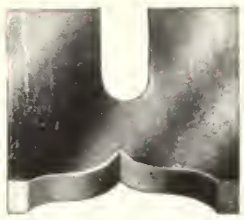
Now is a good time to look into this.

J. M. NASH, Milwaukee, Wis.

ATKINS

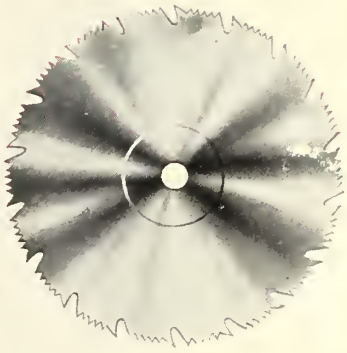
STERLING QUALITY

SAWS and KNIVES



As Demand Increases it Will not Benefit You—

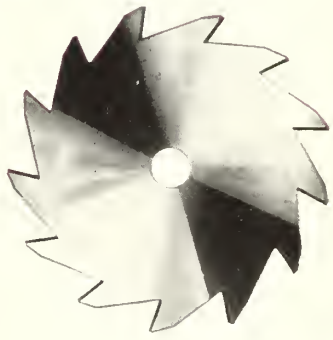
unless your mill is equipped with the right kind of Saws, Saw Tools and Machine Knives.
Now, there is only ONE BEST brand to buy; it bears the name



ATKINS

Specify your Saws, Saw Tools and Machine Knives by name. Say "ATKINS." Costs no more in the beginning and saves you money in the long run.

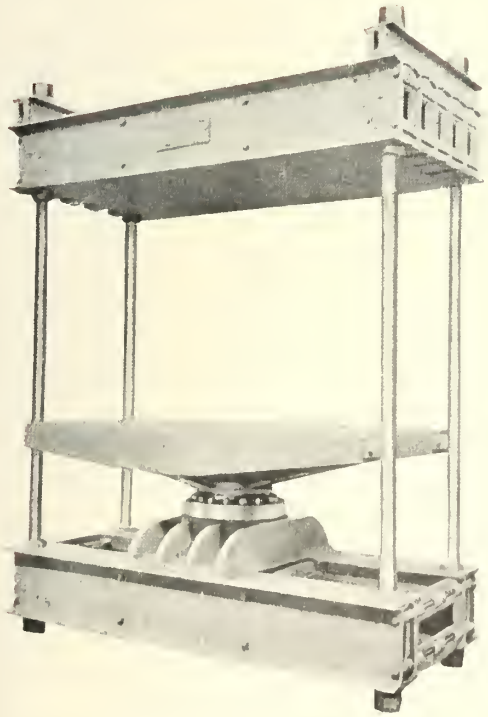
Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.



E. C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**



Hydraulic Veneer Press

Provides **MORE** pressure
Provides **MORE EVEN** pressure
Provides a **MEASURED** pressure

A great many of the leading furniture and woodworking plants in Canada are now using this machine which has these three distinct advantages over the old style screw press.

Write us to-day for prices and full particulars

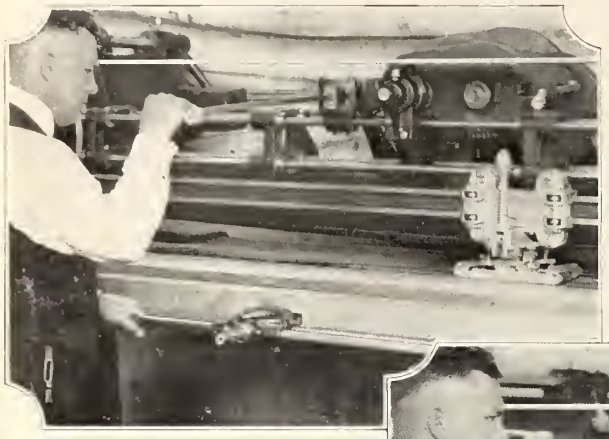
MADE IN CANADA

William R. Perrin

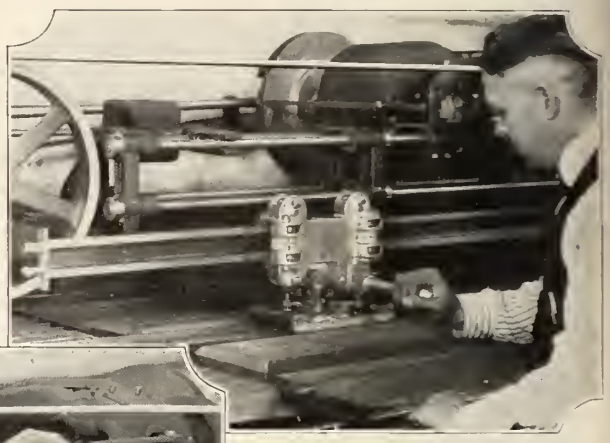
Limited

TORONTO — — Ontario

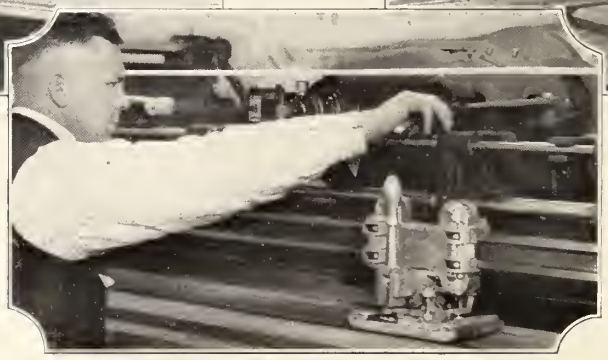
Sand Your Flat Surfaces Automatically



One telescoping hand lever varies length of power stroke and provides pressure contact.



Sanding shoe released from power driving band for spot sanding by hand.



Changing speeds on sanding shoe accomplished by merely pushing clutch lever to the right or left.

THIS brand new No 124 Automatic Sander represents the first real advancement made in this type of machine in many years. It combines power stroke with hand-controlled contact, for spot sanding—really two machines in one. Operator easily adjusts length of power stroke and number of strokes per minute, without moving from his working position.

ALL lost motion at end of stroke is positively eliminated by means of our double-end drive and take-up devices. This insures a smooth reverse motion and prevents any waves or ridges at end of strokes. These are but a few of the many improved features—we want to tell you more about it. Write for descriptive bulletin No. 124.

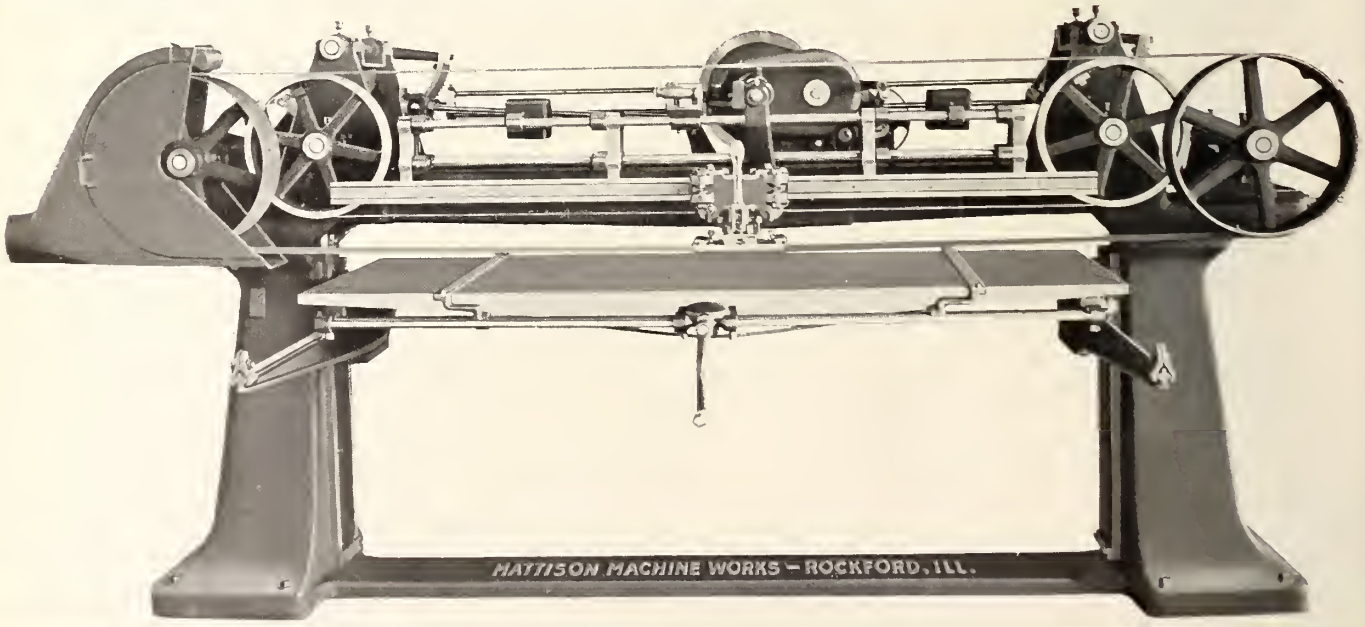
Branch Sales Offices

CHICAGO
SAN FRANCISCO
NEW YORK
GREENSBORO, N.C.

MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.

Sales Representatives for New England:

BAXTER D. WHITNEY & SONS, WINCHENDON, MASSACHUSETTS.



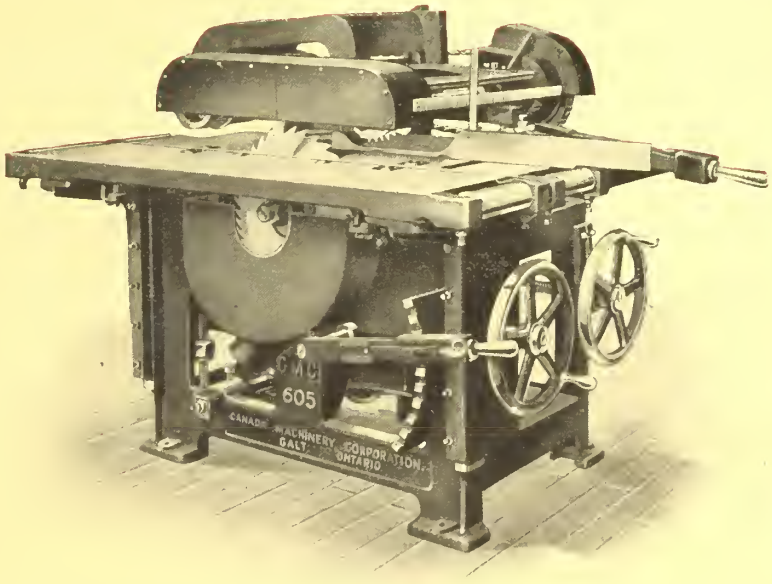
Volume Twenty-Two TORONTO, MARCH, 1922 Number Three

CANADIAN WOODWORKER and Furniture Manufacturer

The Latest

C.M.C.

A "605"
Speeds Production
Raises Quality
Satisfies



No. 605 New Improved Self Feed Rip Saw

Why?

Because it will rip up to 225' per minute.

Because it can be set quicker and easier than old type machines.

Because it rips straight—the strain on the feed is directly in line with the cut and it must go straight.

The table is gibbed to the frame just like a planer.

Because it turns out a lot of first class work.

The Bulletin will tell you why?

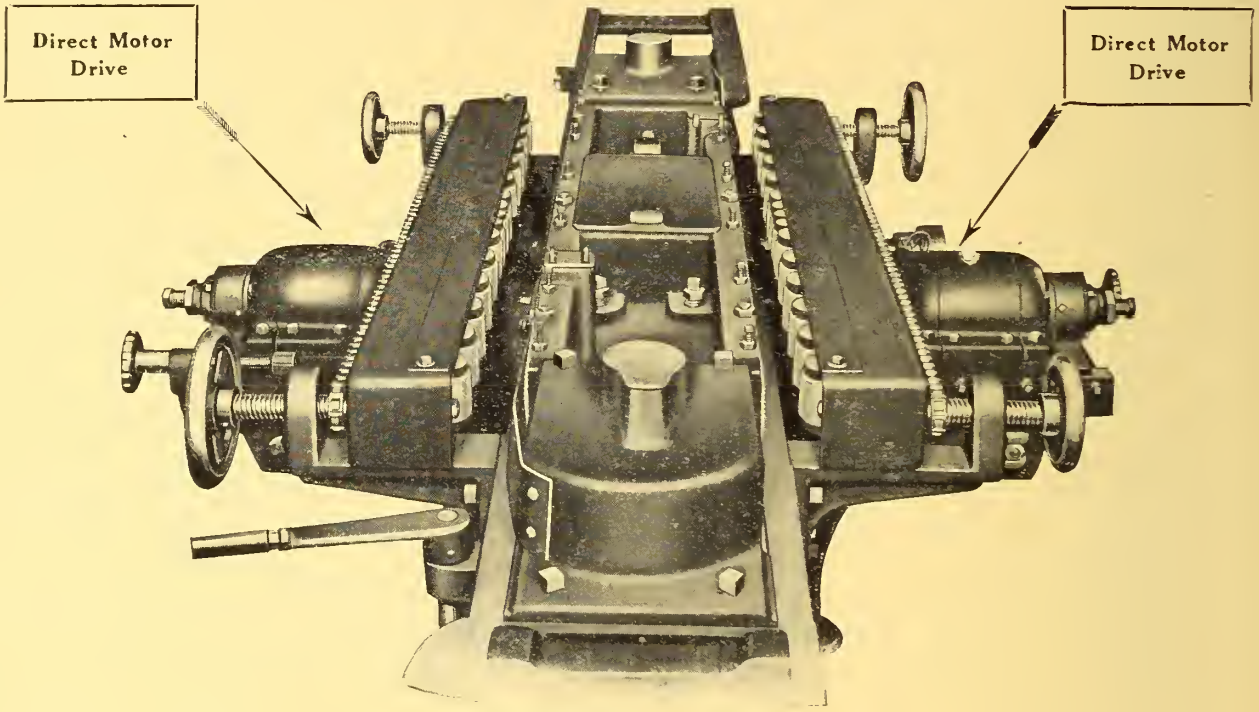
CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - - 721 Bank of Hamilton Bldg.

Alphabetical Index to Advertisers, Page 12

Ball Bearing Direct Motor Drive Glue Jointer and Edge Molder

No Belts **No Countershafts**



No. 429 "Lightning" Automatic Glue Jointer and Edge Molder

With a continuous feed this machine will make the finest glue joints for the highest class of cabinet work many times faster than is possible by hand or on the old reciprocating type. It is the ONLY Automatic Glue Jointer which can be set instantly to make either a straight, hollow or spring joint.

Write for Bulletin H-12

J. A. Fay & Egan Company

Established 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St., CINCINNATI, OHIO

Exclusive Agents for the Dominion:—A. R. Williams Machinery Company Limited, Toronto, Ontario
Branches:— Montreal, St. John, N.B., Winnipeg, Vancouver.

Another "Made In Canada" Product

Re-Drier for Veneers
Any Number of Plates
Any Size Plates Desired

Let us tell YOU about this machine and show YOU how it can serve YOU in your Veneer Room

---

JUST A FEW OF THE MANY WOODWORKING MACHINES WHICH WE SUGGEST FROM OUR LARGE STOCK

Our lines are complete. Have you sent us your inquiry?

1—Used Double Dowel Machine,
3—Used Machines for turning Mouldings,
1—Used Cowan Door Relisher
1—Used McGregor-Gourlay Door Clamp,
1—Used Sturtevant 36" Single Fan
1—Used " 45" Double Fan
1—Used " 48" Single Fan
7—Used Bowser Tanks,
1—Used Double Spindle Boring Machine,
1—Used Kelley Router,
1—Machinery Co. of American 5' Back Gauge,
1—Used American No. 2½ Tenoner,
1—Used Ballantine, Two Spindle Shaper,
1—Used C.M.C. No. 438 Arm Sander,
1—Used C.M.C. No. 507 Power Chisel Mortiser,
1—Used Preston 36" Band Saw.
1—Used Preston No. 121 Pony Planer, 24"
1—Used Oliver No. 8 Wood Trimmer,
1— " Cowan 13" Four Side Moulder,
1— " Cowan M-277 32" Automatic Knife Grinder,
1— " Post Borer,
1—New American No. 30 Universal Saw Bench,
1— " " No. 25 Edging and Ripping Saw,
1— " " No. 3 Double Cut-off Saw,
2—Used American No. 229 9" Hardwood Planer and Matchers

1—New American No2. Dise and Spindle Sander,
1—Used American No. 22 Four Side Moulder,
1— " Hespeler, 10" Four Side Moulder,
1— " Houston 8" Four Side Moulder,
1— " American No. 2 Hand Feed Rip Saw,
1— " American 36" Double Dise Sander,
1— " Berlin 36" Three Drum Sander,
1— " Dodds 10 Spindle Dovetailer,
1— " Reynolds Screw Driver,
1— " Covel No. 40 Automatic Saw Sharpener,
1— " Cowan 10" Four Side Moulder,
1— " Jackson-Cochrane Chair Seat Former,
1— " Four Spindle Horizontal Boring Machine,
1— " Knob Turner,
4— " Embossing Machines for mouldings
1— " Goldie-McCulloch Two Spindle Shaper
1— " Goldie-McCulloch Dowel Sticker,
1— " Revolving Bed Planer, 24"
1— " Cant-Laidlaw 8" Four Side Moulder,
1— " Cant-Gourlay 8" Four Side Moulder
1— " McGregor-Gourlay Small Self-feed Rip Saw
1— " Crescent Small Rope Moulding Machine
1— " Arm Sander,
1— " Goldie-McCulloch Single End Tenoner,
1— " Cameron & Co. Single End Tenoner,
1— " Cowan Horizontal Chisel Mortiser,

Garlock Machinery Limited

163 Dufferin Street

WINNIPEG - TORONTO - MONTREAL

Everything in Woodworking and Metal Working Machinery

A BETTER MACHINE, FOR A BETTER JOB, FOR BETTER TIMES

We have the following very fine machines to offer—a few selections from our very large stock—

Practically new type 2-G Yates Straight Edge Rip Saw, with a 10" saw, revolving bed.
Used McGregor Gourlay QY 15 x 6 Planer and Matcher. Thoroughly overhauled.
Practically New No. 112 Fay and Egan "Lightning" Flooring Planer, planes and matches 6" wide, 4" thick, 8 feed rolls. 40 HP required to operate.
New No. 162 Preston High Speed Ballbearing Shaper speed 7,000 revolutions per minute. Table 58 x 41, spindles 1-¼", 28" centres.
Used 24 x 6 Cowan Planer and Matcher, like Cowan No. 11, but the gears are not guarded.
Used No. 4½ 30" American Sectional Roll Cabinet Planer, a very fine surfacer, for cabinet work, in hard or soft woods, with sectional feed rolls and sectional chipbreaker.
Used Wysong and Miles type Belt Sander. In first-class condition.
New No. 143 Preston 10" moulder on base, fitted with slip on heads, variable feed. Latest design embodying all known improvements.
Used 42" Berlin Royal "Invincible" 3 drum Sander, with power raising rolls and spiral drums, with solid bed.
Used 48" Berlin "Invincible" three drum Sander, with spiral drums and hand power raising rolls.
Practically new 20" Preston Jointer, with round safety cylinders.
New 12" Preston Jointer with round safety cylinder.
New C.M.C. 12" Buzz Planer with round cylinder.
Used No. 177 30" Berlin Double Surfacer with divided rolls.
Used 26 x 10 McGregor Gourlay Double Surfacer, similar to C.M.C. No. 216.
No. 107 Crescent Woodworker, consisting of 26" band saw, with tilting table, rip and cross cut saw table, reversible shaper, Boring Machine, and 12" Jointer. This is the last word in woodworker construction.
Beach No. 8 Rip and Cross Cut Saw Table, with 6" Jointer, and Boring Machine.
Beach No. 3 6-stop Boxmaker's Cut Off Saw, with 6' carriage. An indispensable machine in a boxmaking Plant.

The Prices are Right.

The A. R. Williams Machinery Co. Limited

64 FRONT ST. WEST - TORONTO

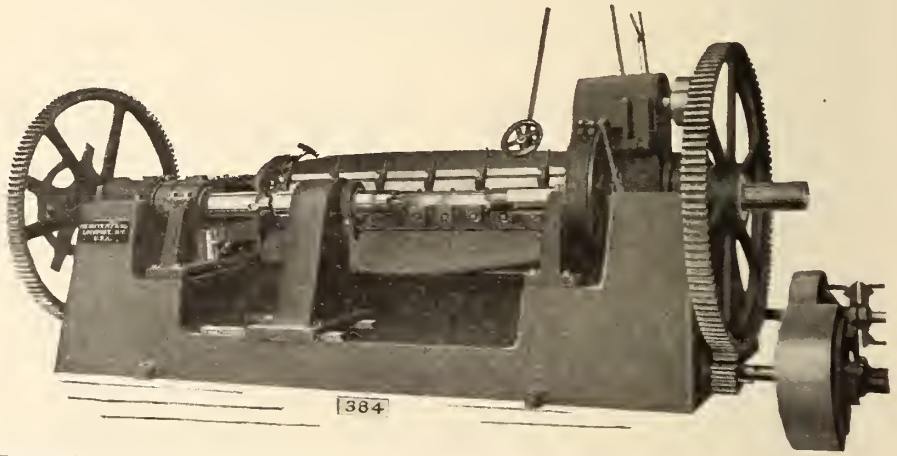
Phone Woodworking Machinery Dept., Adelaide 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractors' Machinery, Electric Motors, Saws, Shingle and Lath Mill Machinery, etc.

HALIFAX, N.S. ST. JOHN, N.B. MONTREAL, P.Q. TORONTO, ONT.
VANCOUVER, B.C. WINNIPEG, MAN.

MESCo

Valuable Features of the Merit Veneer Lathe



The FEED GEAR MECHANISM is simple, compact and powerful. No chains.

The POWER DOGGING and QUICK FEED motions are provided by double frictions giving the same speed in both directions.

There is an automatic stop to throw out the feed before the chucks are raached.

The KNIFE MOUNTING provides a hand wheel PITCH CONTROL as well as an AUTOMATIC PITCH to maintain the same knife setting for all sizes of log.

The PRESSURE BAR is under control of a hand wheel which regulates the pressure over the WHOLE LENGTH OF THE CUT. An eccentric rotary mounting gives this bar THREE POSITIONS,—(1) Cutting position (2) Clearance position (3) Tilted position. All three are operated by THE CLEARANCE lever which draws back the bar, tilts it, and returns it to the original position without changing the working adjustment.

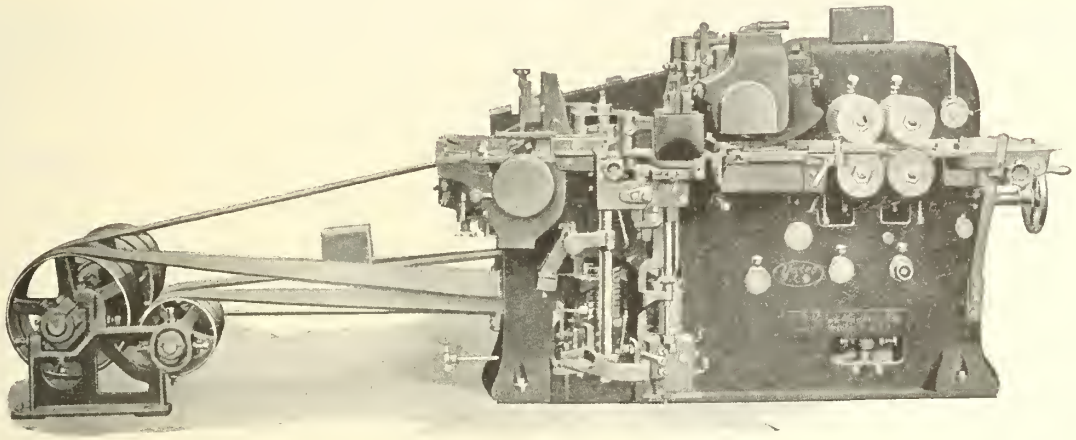
An AUTOMATIC VERTICAL adjustment of the bar maintains the proper height for each thickness of veneer.

MERITT

VENEER MERIT MACHINERY FOR FAR SIGHTED BUYERS

MERRITT ENGINEERING AND SALES COMPANY LOCKPORT N.Y.

VENEER MERIT MACHINERY FOR FAR SIGHTED BUYERS



TYPE "C" MOULDER

The type "C" Moulders were designed for turning out the smaller size mouldings at high speed and still give you that fine finish which is necessary on this class of work. As you will note from the above cut it is a very compact machine, takes up less room than the old sticker and is entirely open side, which allows for quick set ups and changes as well as ease of adjustment. Feed Ranges up to 100 feet per minute are provided. Built in two sizes C3 4″x4″—C4 4″x8″.

Many other features are described fully in a circular we have prepared.

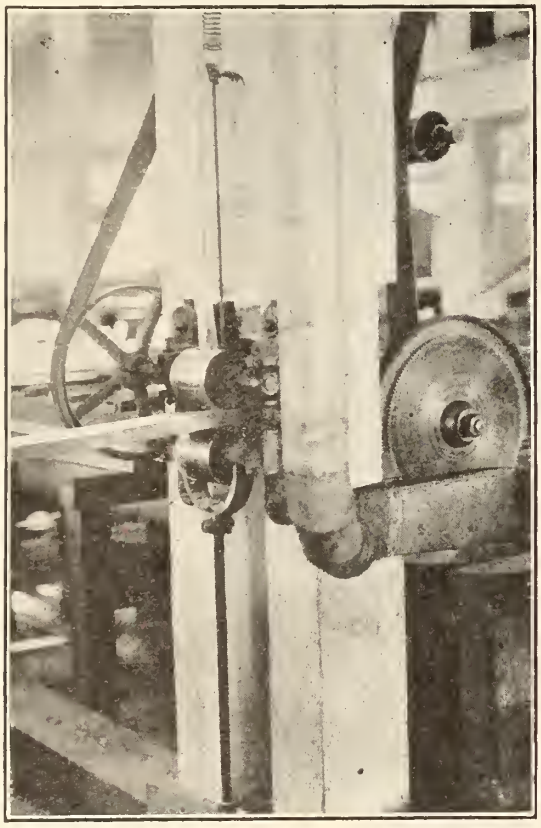
Write for your copy

P. B. Yates Machine Co. Ltd.

Hamilton - Canada

YATES

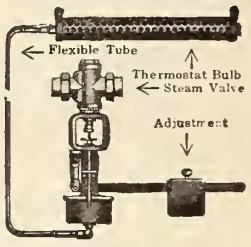
A Real Trimmer



This is a high speed machine to be used in sawmills and box factories where speed is required. Allows men to use both hands when trimming. Nothing to get out of order. This is the fastest trimmer on the market.

Arbuthnot Lumber, Sash and Door Co.

Vancouver, B.C.



The Powers Regulator No. 15

For control of air temperatures. The thermostat bulb is so constructed that it may be placed in any position in the room to be controlled, and connected with the steam valve by a flexible tube, of any required length. It is very sensitive and reliable. Entirely automatic and self-contained requiring no outside power for its operation.

Do You Know—Or Do You Guess?

You take pride in the uniform quality of your output—you insist upon exactness in every operation.

But do you *know*—in the kiln, where temperature is so vital a factor—that the heat is always exactly right?

If temperatures are controlled by hand you *know* the variations will creep in—but you *guess* there won't be enough to affect the final result.

Don't Guess

Control temperatures with a Powers Automatic Thermostatic Regulator and *know* that the variations won't occur.

Our Bulletin will be sent free on request and we will gladly answer any questions on heat control. It has been our sole business for over 30 years.

The Canadian POWERS REGULATOR CO Ltd
Specialists in Automatic Heat Control
82 CHESTNUT ST., TORONTO, ONT.
(1283C)

The Shimer Round Safety Cylinder with High Speed Knives

A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

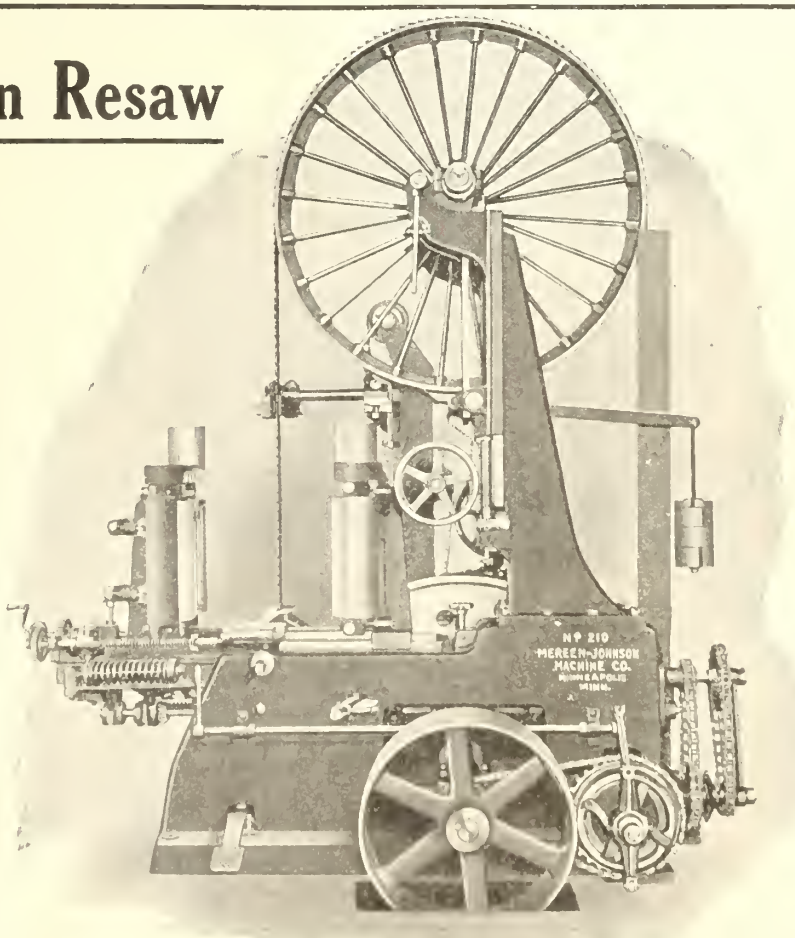
The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

No pulleys—no belts—no frictions.

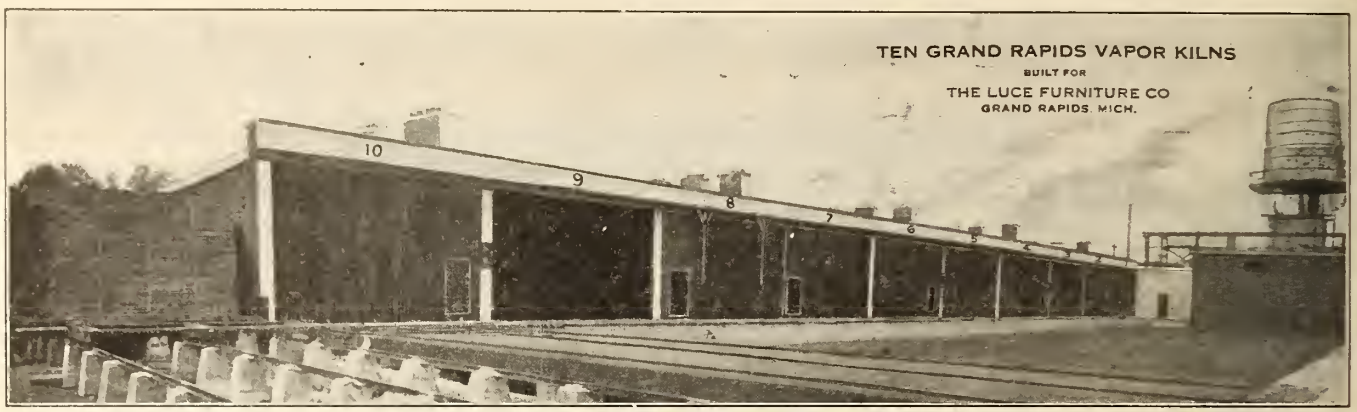
The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

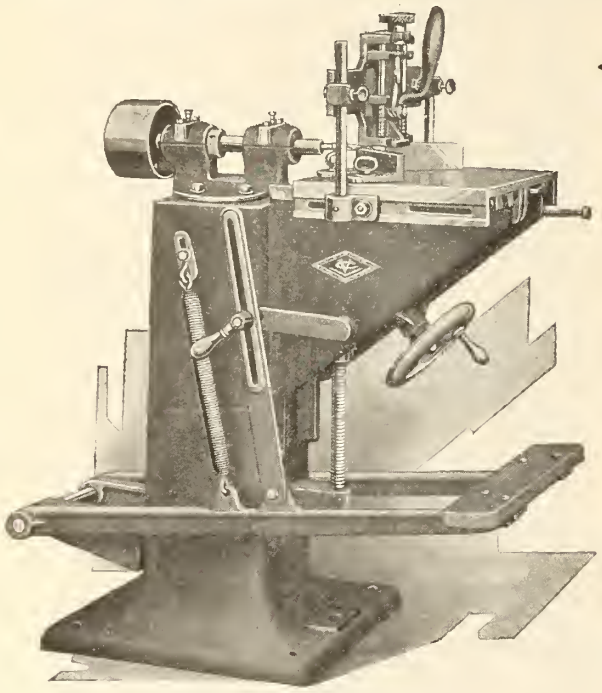
Write for circular.



Mereen-Johnson Machine Co.

Minneapolis Minnesota, U.S.A.





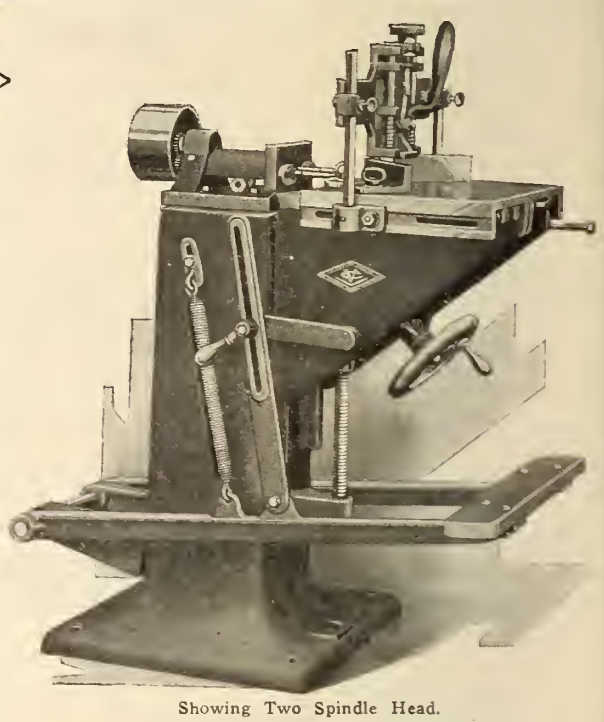
Showing Single Spindle Head.

VALLEY CITY MACHINE WORKS
GRAND RAPIDS, MICH. U.S.A.

The New Combination Single Spindle Horizontal and Two Spindle Close Center Boring Machine.

This Machine is furnished with two heads, making it a general purpose tool for horizontal boring. The use of the single spindle head is obvious. This can be removed in a few moments and the two spindle head substituted.

The Two Spindle Close Centre Head will bore two 5/16 holes anywhere in a 2" circle with minimum centres of ½". **The Quick Action Clamp** eliminates the old stick.



Showing Two Spindle Head.

Canadian Representatives:

The A. R. Williams Machinery Co., Ltd.

Toronto Montreal St. John Winnipeg Vancouver Halifax

Remember we can bore all of your holes at one time if you so desire

VALLEY CITY MACHINE WORKS

Campau Ave. and Fulton St., N. W. Grand Rapids, Michigan, U. S. A.

The

"Steelgrip"

METHOD IS THE BEST

for making mitered, butt or any other joint

Used by all leading Furniture, Cabinet and Casket Manufacturers.

In using *"Steelgrip"* CLAMP NAILS

only the ordinary machine work is required. Cut a slot, drive in a "Steelgrip," that's all. No clamping, no waiting for glue to set.

Avoid Substitutes

"Steelgrip" CLAMP NAILS

Save Time + Labor = Money

Produce, Strength + Durability = Better Product

Shipped in cartoons of 1 lb. 5 lbs. and 10 lbs. each. Bulk packages 25 lbs., 50 lbs. and 100 lbs. each

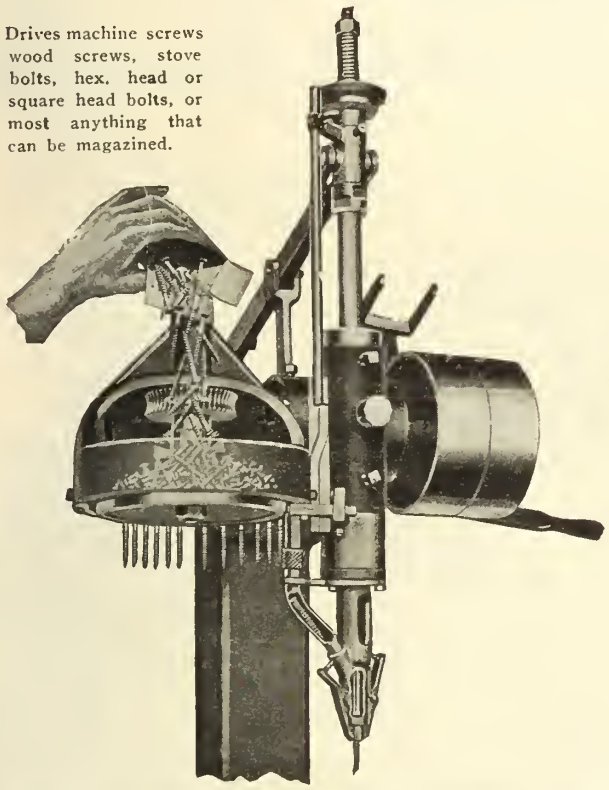
CLAMP NAIL COMPANY

4532 PALMER STREET, CHICAGO

CIRCULARS and SAMPLES ON REQUEST.

The Demand is for Lower Prices!

Drives machine screws wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.



Reynolds Automatic Screw Driving Machinery will help you meet the demand

Everywhere the manufacturer is faced with the problem of price reduction. How can he find the solution?

By cutting out every waste—of time, labor materials, etc.

Many manufacturers have installed Reynolds Screw Driving Machinery for this reason. It accomplishes the work better in one-third of the time.

Consequently they are able to meet the demand for lower prices and hasten the return to normal buying.

Are you interested? Then write us to-day for the full facts.

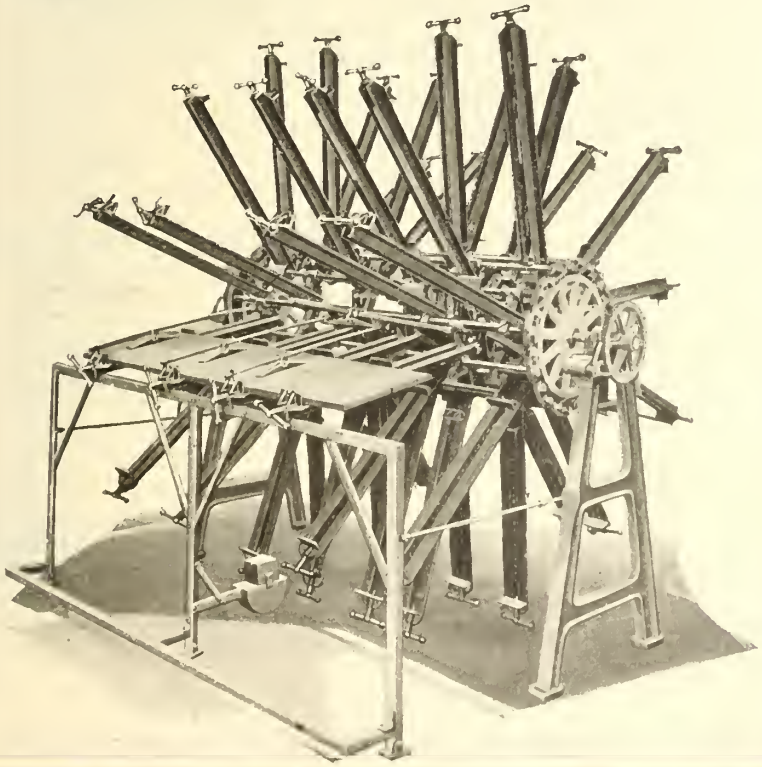
Send us dimensions over all of your work and gauge and length of screws driven so that we can determine the proper size and type machine to meet your requirements.

The Reynolds Machine Co.

Department C.

Massillon, Ohio, U.S.A.

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK

CLAMP CARRIER

for

Small Jobs in the Big Plant
All Jobs in the Little Plant

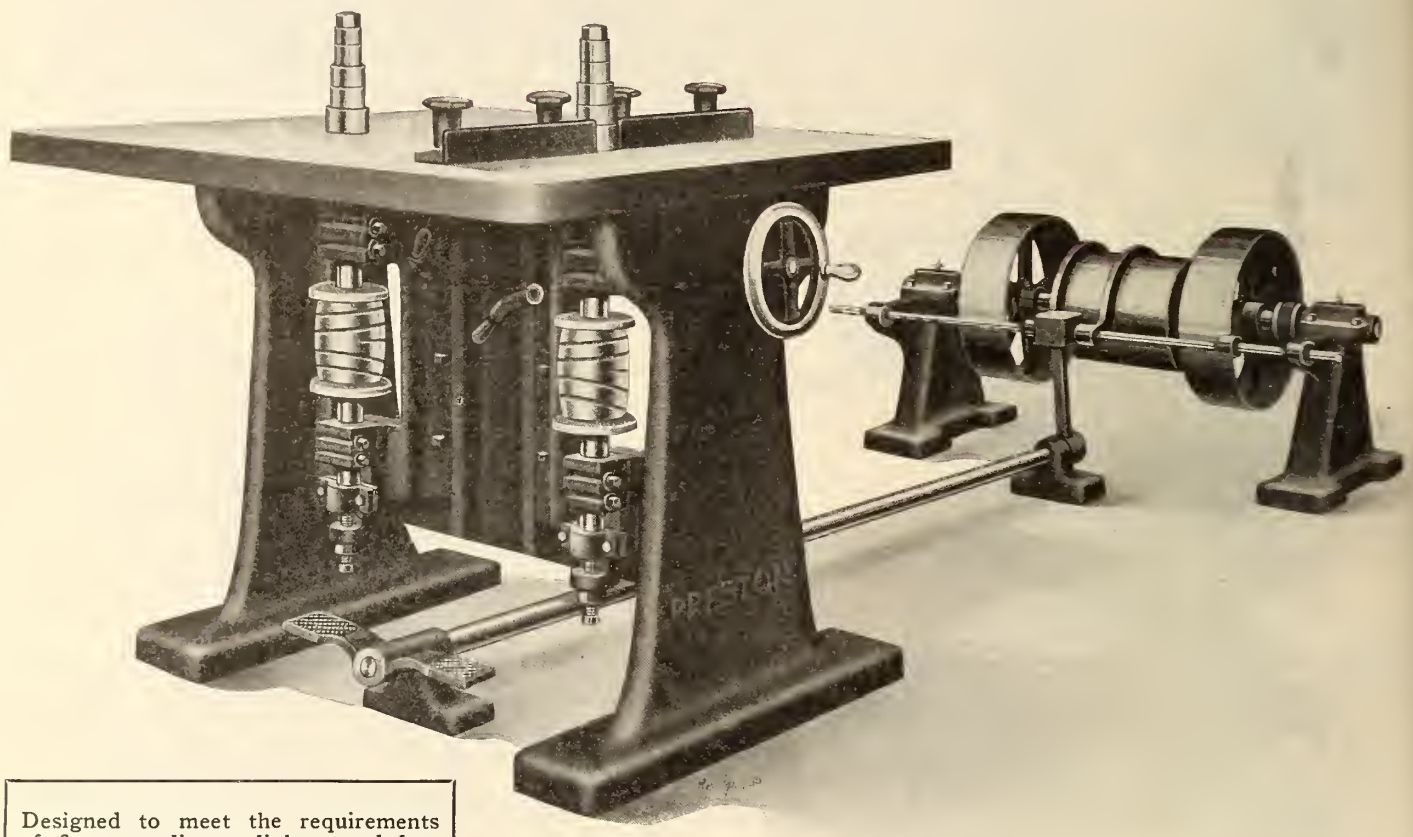
1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.

A NEW SHAPER
"Preston" No. 164 Ball Bearing



Designed to meet the requirements of firms needing a lighter and less expensive Shaper than our No. 162.

Made with

Babbitt Bearings, Plain Countershaft
S K F Ball Bearings, Plain Countershaft
S K F Ball Bearings, Special Countershaft

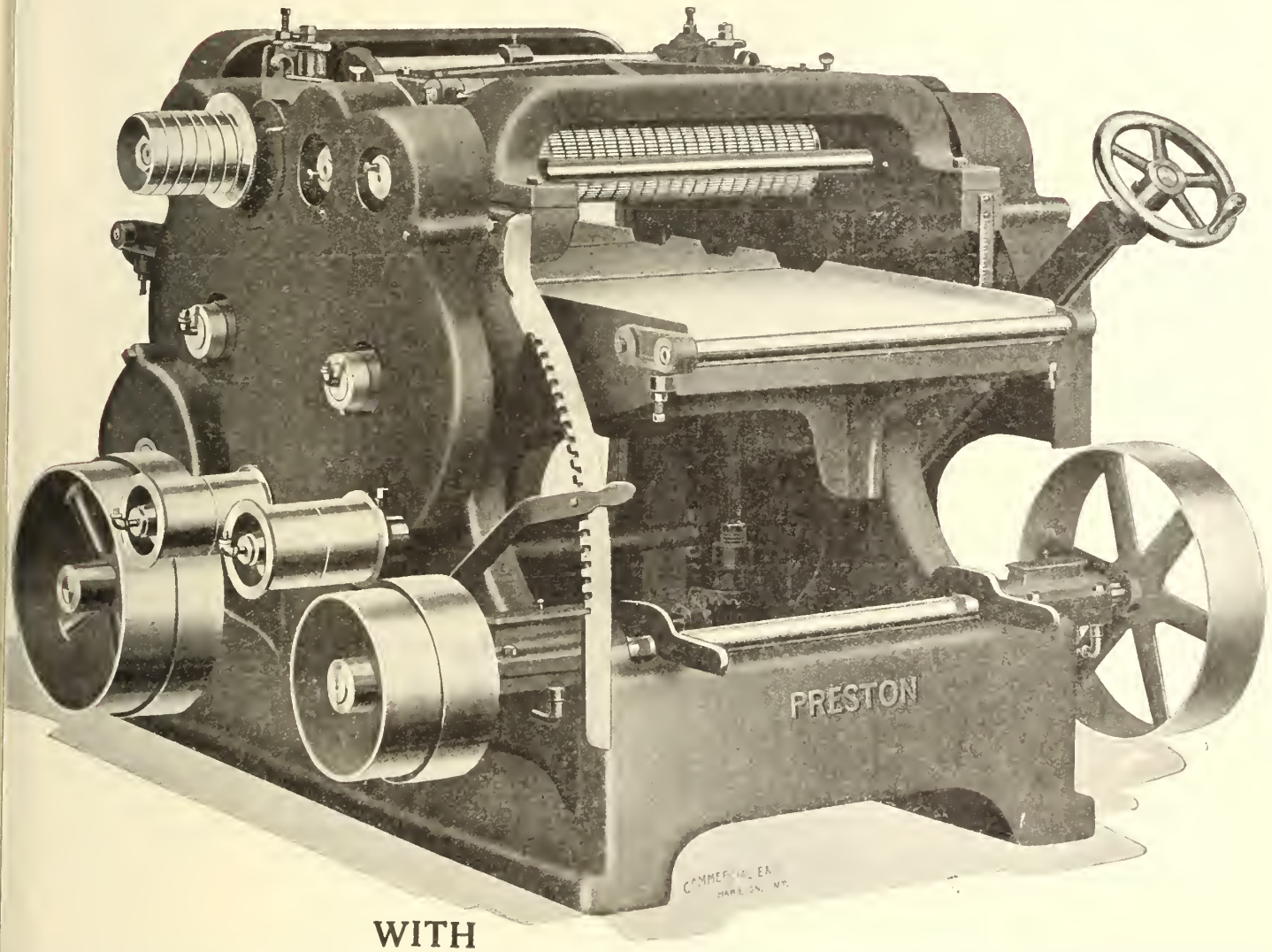
This machine, equipped with BALL BEARINGS, will be found particularly suitable for the needs of many firms. Don't hesitate to ask for information.

WE ARE SHAPER PEOPLE and make Shapers for every purpose. Ten years of careful study and research have placed us in the enviable position of being able to supply information and advice not easily gained elsewhere.

The Preston Woodworking
PRESTON,

We are Sole Manufacturers of and Agents in Canada for the Eaglesfield Patented Beltless Swing Saw.

No. 123 "Preston" High Speed Ball Bearing Surface Planer



WITH

(1) Specially selected S. K. F. Ball Bearings (2) Sectional Roll and Sectional Chipbreaker (3) Round Cylinder with 4 High Speed Knives (4) Stockbridge Knife Grinder and Jointer (5) Cylinder Speed, 5000 r.p.m.

IT WILL:—(1) Reduce Your Sanding Costs! and (2) Increase Your Production!

WE GUARANTEE THESE TWO POINTS. Your planing will not only be done much more quickly but it will be done so much better that a very great percentage of your sanding will be eliminated. Let's prove to you how quickly it will pay for itself. Competition is keen and it will surely reduce your production costs and help you in the race.

Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

Alphabetical List of Advertisers

Adjustable Clamp Company 109
Algoma Panel Co. 85
American Hardwood Lumber Co 27
American Saw Filing Machine Co. 105
American Walnut Mfrs. Ass'n. 32
Anderson, Shreiner & Mawson 92
Anderson Tully Co. 93
Arbuthnot Lumber, Sash & Door Co. 6
Atlantic Lumber Company 26
Atlas Mfg. Co. of Orlando 108
Atkins & Co., E. C. 119
Ault Wiborg Co. 74

Bachman F. M. 90
Banning Leland G. 30
Batavia Clamp Co. 109
B.C. Lumber Commissioner 27
Behr Co., Inc. Herman 24
Bigelow-Cooper Lumber Co. 29
Barr-Holiday Lumber Co. 41
Birds Eye Veneer Co. 76
Black Bros., Co. 107
Bonner & Sons, J. H. 34
Brantford Pattern Works 118
Bruce Co., E. L. 36
Bruce Woodworkers 17
Buffalo Hardwood Lumber Dealers 42
Bury & Company, Robt. 48

Calhoun Plywood Co. .....S..... 28
Canada Machinery Corporation 1
Canada Wood Specialty Co. 26
Canadian Appraisal Co., Ltd. 17
Canadian Blower & Forge Co. 104
Canadian General Lumber Co. 99
Canadian Nashua Paper Co. 24
Canadian Powers Regulator Co. 6
Canadian S. K. F. 111
Carborundum Co. 113
Carter & Co. E. T. 74
Casein Mfg. Co. 20
Central Veneer Co. 81
Chapman & Dewey Lumber Co. 36
Chattanooga Machinery Co. 118
Clamp Nail Co. 8
Clark & Son Ltd., Edward 25
Coignet Chemical Products Co. 115
Colborn, C. B. 34
Comfy Cushion Co. 69
Cowan & Co. 12

Delaney & Petit Limited 70
DeVilbiss Mfg. Co. 75
Doon Twines 70
Dry Kiln Door Carrier Co. 107

Eagle-Ottawa Leather Co. 68
Eaton & Sons, J. R. 28
Elliot Machinery Co. 117
Engineering & Machine Works of Canada Ltd. 116
Empire Tool Works 109

Farrin Lumber Co., M. B. 48
Fay & Egan Co., J. A. 2
Flint Varnish & Color Works 74
Foster, Merriam Co. 23
Frye Lumber & Veneer Co., J. W. 80

Gall Lumber Co. 99
Garlock Machinery Ltd. 3
General Machinery Co. 99
General Hardwood Lumber Co. 24
Globe Vise & Truck Co. 108
Grand Rapids Vapor Kiln 8
Gulf Lumber & Trading Co. 35
Guelph Patent Casket Co. 107

Hafner Mfg. Co. 46
Hamilton Gear & Machine Co. .....
Hartzell, Geo. W. 37
Hawker Mfg. Co., W. S. 18
Hay & Company 91
Hay & Co., Peter 105
Hewitt Lumber Co., D. E. 40
Heeney, Percy E. 28
Hoffman Bros. Co. 81
Hyde Lumber Co. 34

Ideal Fence & Spring Co. of Canada, Ltd. . 69
International Business Machines 110
Jackson, Cochrane & Co. 15

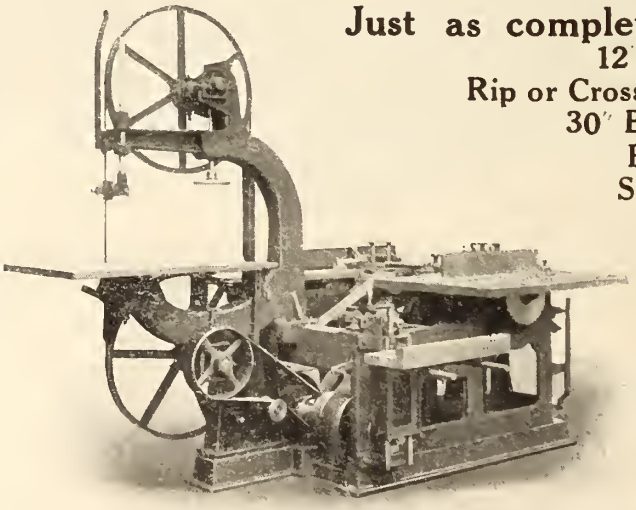
Kinnon Lumber Co., Ltd. 105
Klotz Machine Co. 107
Kosse, Shoe & Schleyer Co. 45
Kraetzer-Cured Lumber Co. 103

Cowan Universal Woodworker 323

All Right Hand Machines Independently Driven.

Built on a solid one-piece casting and arranged for greatest convenience.

Ample Belt Power



Just as complete as you want it
12" Jointer
Rip or Cross Cut Saw Table
30" Band Saw
Borer
Shaper

—*Also*—
Attachments for Hollow Chisel Mortising
Knife Grinding
Sanding
Resawing
Panel Raising
Moulding

A post card will bring you full particulars and price.

Cowan & Company of Galt Limited

Galt Ontario Canada

ASSET vs LIABILITY

Are your present Dry Kilns producing perfectly cured lumber, in the least possible time and at a minimum cost? If not, your kilns are a liability and you are daily adding unnecessary expense to your production cost.

NATIONAL AUTOMATIC HUMIDITY CONTROLLED DRY KILNS will not only meet the above requirements, but will pay for themselves in from one to two years' operation. Recently one of our customers, in writing about their kiln, made the following statement: "The controls, together with the arrangement of the equipment and the modern instruments, have enabled us to put our unusually green Oak lumber through with such a great reduction in degrade as to substantially permit us to state that the first two years of operation will pay the entire cost of the new installation, merely by saving in degrade. We believe you are to be congratulated upon your product and that we are to be congratulated upon being the possessor of this installation."

NOW UNDER INSTALLATION

Canadian National Railway Co., Leaside, Ontario;—one.

The Watt Milling & Feed Co., Ltd., Toronto, Ontario;—three.

S. Anglin & Co., Kingston, Ontario;—one.

National Cooperage Company, Toronto, Ontario;—one. . . . . .

The Globe Furniture Company, Ltd., Waterloo, Ontario;—two.

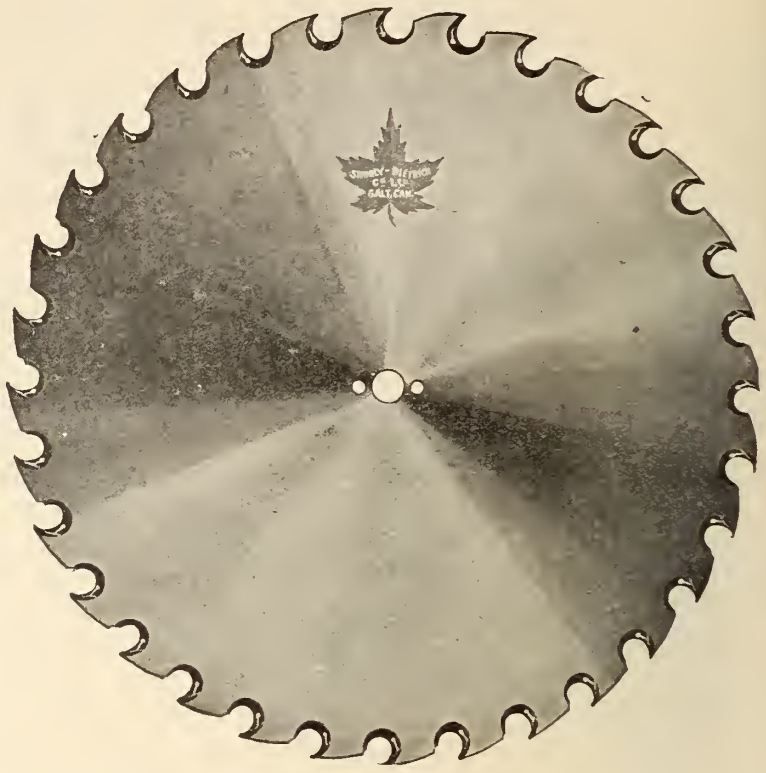
NATIONAL KILNS are an asset to the productive ability of woodworking manufacturerh. Whether you are in need of remodeling your present kilns, or in need of additional kiln capacity, kindly write us today.

C. A. FIELDS, Canadian Representative, P. O. Box 55, TORONTO

The National Dry Kiln Co., 1117 East Maryland Street., Indianapolis, Indiana

NATIONAL DRY KILNS

MAPLE LEAF SAWS



We guarantee each saw to be made of the finest razor steel, tempered by a secret process, and to be free from seams or flaws. A Maple Leaf Saw gives the longest and most efficient service and is the cheapest first and last.

The complete "Maple Leaf" line includes Bands, all kinds of special saws for special work, cross-cut Saws, Gang Saws, Dado Heads, Etc.

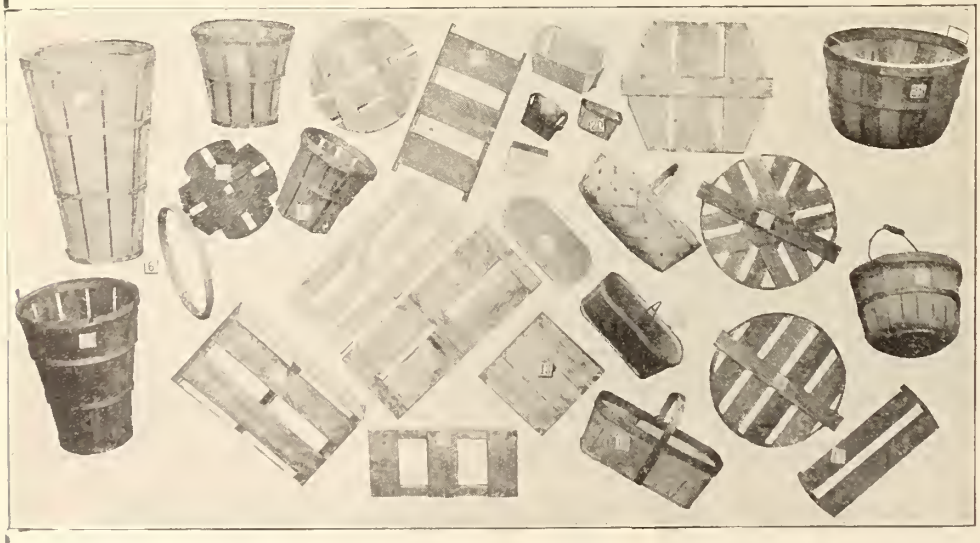
Write for catalog.

The Largest All-Canadian Saw Manufacturers

SHURLY-DIETRICH, LIMITED, GALT, CANADA

Store & Repair Branches at Vancouver & Ottawa

THIS IS THE NAME



of the Machinery for the Rapid Production of

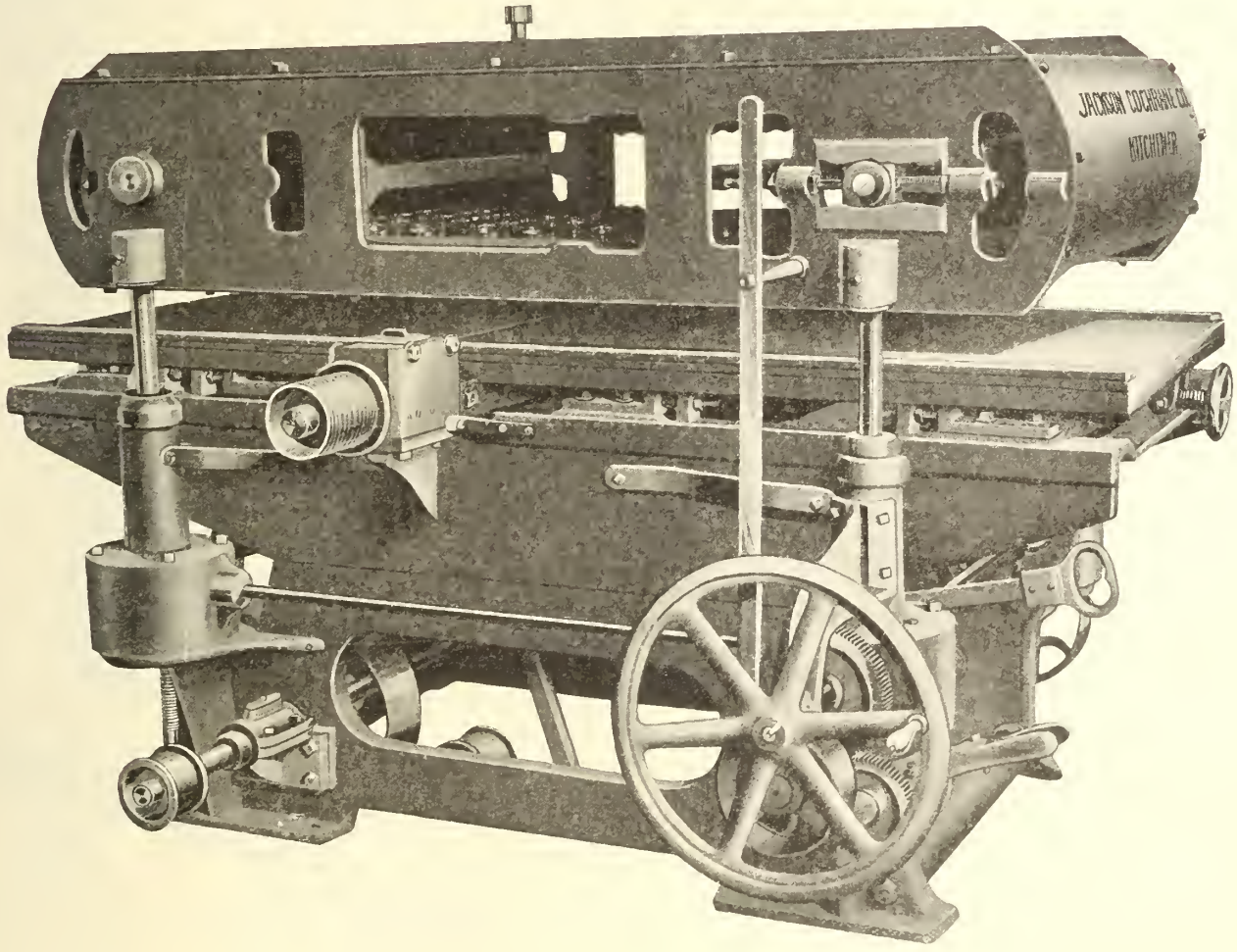
Veneer—Crates—
Baskets—Fruit Packages.

"St Joe"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

"HERZOG" SELF - FEED JOINTER



Two Boys Could Operate this Jointer for You

Think what a saving that would effect in your shop—two boys doing the work—better—and from three to five times faster than hand jointers. Such efficiency is made possible by the many splendid qualities the machine posses ses, its simplicity of operation, its ruggedness of construction and its ability to work at high pressure without frequent breakdowns.

The Herzog Self-Feed Jointer handles stock varying in width from 1 inch to the full width of the machine. It will operate at fast or slow speeds while the knives require about one-fifth the attention given hand jointers.

We would like to send you full particulars and prices. May we?

Jackson, Cochrane & Company

KITCHENER - CANADA

Alphabetical List of Advertisers—Continued

Laidlaw Bale Tie Co. ... 108
Larsen & Shaw Ltd. ... 19
Litton Veneer Co. ... 80
Liverpool Hardwood Co., Inc. ... 46
Long-Knight Lumber Co. ... 91
Luehrmann Hardwood Lumber Company, Chas. F. ... 27

Maley & Wertz Lumber Co. ... 25
Marietta Paint & Color Co. ... 70
Mattison Machine Works ... 120
May Hardwood Co., R.R. ... 27
McDonagh Lumber Co. ... 28
McKenzie Machinery Co. D. ...
McKnight & Son Co., L. G. ... 118
McLennan Lumber Co., Ltd. ... 26
Memphis Bandmill Co. ... 41
Memphis Veneer & Lumber Co. ... 81
Mercereau Hawkins Tie Co. ... 44
Mereen-Johnson Machine Co. ... 7
Merritt Engineering & Sales Co. ... 4
Miller Lumber Co. ... 31
Mohawk Veneer Co. ... 80
Morgan Machine Co. ... 117
Mowbray & Robinson ... 38
Munising Woodenware Co. ... 90
Murelle Lumber Co., L. D. ... 35

Nash J. M. ... 118
National Hardware Co. ... 19
National Dry Kiln Co. ... 13
Neville-Cooper Co. ... 20
Nichols & Co., A. S. ... 75
Nichols & Cox Lumber Co. ... 34
Northwestern & Cooperage Lumber Co. ... 79

Oakey & Sons, John ... 108
Ober Manufacturing Co. ... 109
Ohio Veneer Co. ... 79
Oliver Machinery Co. ... 17
Oriental Textiles Co. Ltd. ... 69
Otis Mfg. Co. ... 43
Overton, S. E. ... 115

Pedwell Hardwood Lumber Co. ... 28
Penrod-Jurden Co. ... 82
Penrod Walnut & Veneer Co. ... 82
Perkins Glue Co. ... 21
Petrie Ltd., H. W. ... 115
Pettingell Machine Co., The ... 105
Pickrel Veneer Co. ... 83
Porter Machinery Co., C. O. ... 115
Preston Woodworking Mach. Co ... 10-11
Purcell Walnut Lumber Co., Frank ... 38

Radcliff Saw Mfg. Co. ...
Reese-Sheriff Lumber Co. ... 45
Reynolds Machine Co. ... 9
Richards Hardwood Co. ... 30
Richards-Wilcox Canadian Co. ... 105
Rowe Mfg. Co. Henry ... 108
Rush Lumber Co. ... 39
Shantz, P. E. ... 20
Shimer Cutter Head Co. ... 7
Shurly Dietrich Co. ... 14
Sidmans Limited ... 95
Simonds Canada Saw Co. ... 119
Smith Lumber Co., Payson ... 27
Smith, Sam D. ... 24
Sondheimer Co., E. ... 29
Standard Dry Kiln Co. ... 16
Standard Veneer Co. ... 81
Stark & Co., Jas. E. ... 44
Steele & Hibbard Lumber Co. ... 44

Stimson & Co., J. V. ... 40
Stimson Hardwoood Co. ... 33
Stimson Veneer & Lumber Co. ... 33
St. Joseph Iron Works ... 14

Taylor Mfg. Co., Jas. L. ... 9
Tennessee Lumber & Coal Co. ... 39
Thomas & Proetz ... 31
Thompson & Co., Inc., Lewis ... 32
Toronto Blower Co. ...
Toronto Veneer Co. ... 89
Turner-Faber-Love Company ... 97

Vail Cooperage Co. ... 46
Valley City Machine Works ... 8
Van Atta & Co., E. B. ... 107
Veneer Manufacturers Co. ... 83
Virginia Wheel & Hole Sawing Machine Company ... 17

Waddell Mfg. Co. ... 19
Walter & Sons, J. ... 22
Wayne Lumber Company ... 40
Watertown Table Slide Company ... 20
Whiting Co., Wm. S. ... 44
Willey Company, C. L. ... 87
Williams Machinery Co., A. R. ... 4
Williamson Veneer Co. ... 84
Wisconsin Lumber Co. ... 47
Wisconsin Veneer Co. ... 80
Wood-Mosaic Company ... 86

Yates Machine Co., Ltd. P. B. ... 5
Yellow Poplar Lumber Co. ... 39
Young Lumber Co., Bedna ... 40

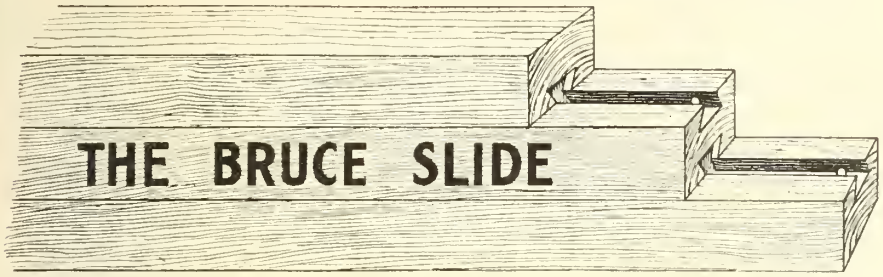
"easy on the operator,

as well as on the lumber—he's human like the rest of us; when he found the controls simple and placed so he could use them without bother, he did ***more*** on your kiln and ***we*** got better dried lumber—that's why we 'swear by'

THE STANDARD DRY KILN"

Praise from our Users is always from the practical man's viewpoint, like the above. Put our book on kilns in your files. Address: The Standard Dry Kiln Co., 1542 McCarty St., Indianapolis.

TABLE SLIDES TABLE RIMS TABLE PINS



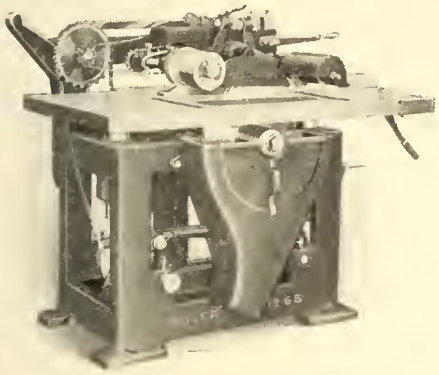
Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

"OLIVER"

You expect more from an "OLIVER"



After 9 Years

Messrs. C. B. COTTRELL & SONS CO., Westerly, Rhode Island wrote us as follows:—

"In reference to our No.65 "Oliver" Self Feed Rip Saw, this Saw has been in operation since 1912 on all kinds and classes of work and has proven very satisfactory"

OLIVER MACHINERY CO.
Grand Rapids, Mich., U. S. A.

The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5,000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

Automatic Hole Cutting Machines

The Wheel and Hole Cutting Machine has four automatic movements, all of which work in perfect unison performing their functions in clock-like regularity.

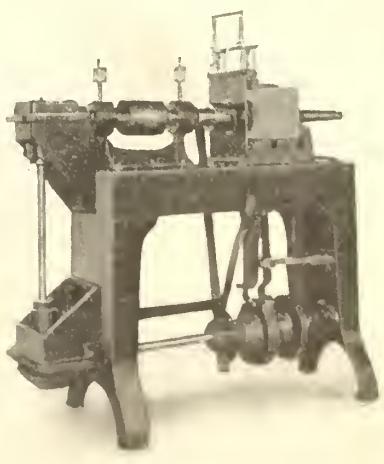
The Hand-Hole Machine will cut hand holes in crate and box ends. It is worked by a carriage and levers, and will cut any size or length hole with either round or bevel edge in any kind of wood

WRITE FOR NEW DESCRIPTIVE CATALOGUE.

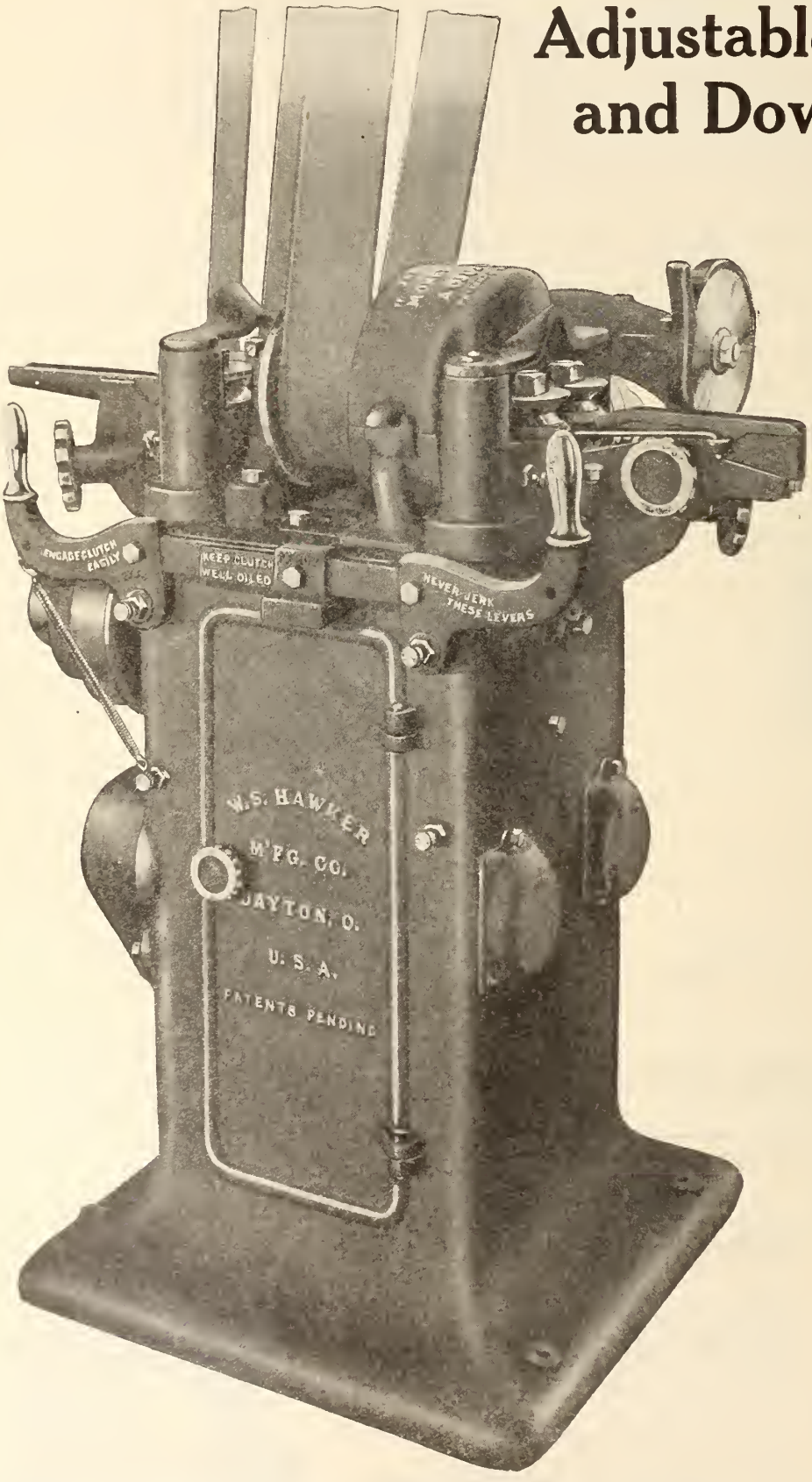
The Virginia Wheel & Hole Sawing Machine Company

S. S. SEE, Manager

14 Third Street N.E. Roanoke, Va.



The Money Maker— Adjustable Rod and Dowel Machine

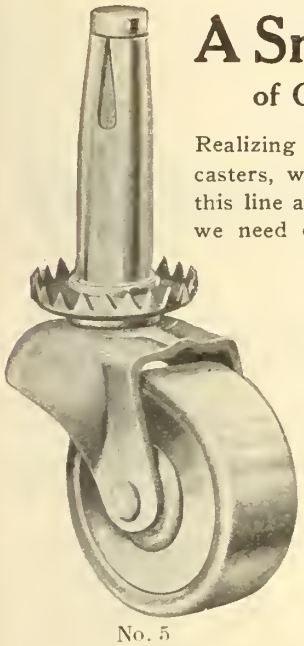


Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio



No. 5

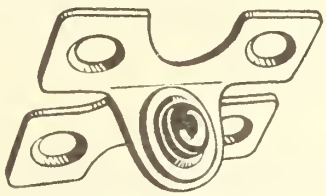
A Small Article
of Great Importance

Realizing the importance of efficient casters, we have made a specialty of this line and as proof of their quality we need only say that many of the foremost furniture manufacturers are using them exclusively.

By the way don't it seem logical that a Canadian-made caster should be the right one to use on Canadian-made furniture? Assuming of course, that it equals the standard of the imported article?

If you believe so too, just write us for samples and prices.

National Hardware Co., Limited
Orillia, Ontario



Friction Hinge

Drawer Fastener

Table Top Fastener

Chair Glide

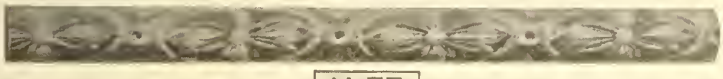
Furniture Trimmings and Special Hardware

We Also solicit your enquiry for Special Stampings

Larsen & Shaw, Limited
Walkerton, Ontario

M 97

M 88



M 77

M 91

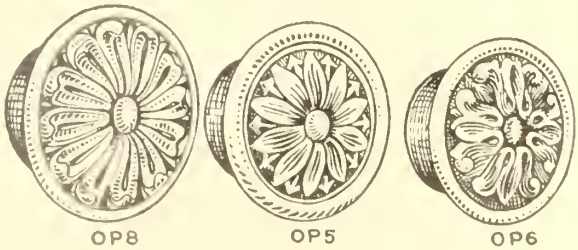
M 72

M 73

MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.



OP8 OP5 OP6

Waddell Manufacturing Company
Coldbrook and Taylor, N. W. **Grand Rapids, Mich.**

If you are using table slides why not use the best. A trial order will convince you.

Watertown Table-Slide Company

Watertown, Wisconsin U.S.A.

Manufacturers of the famous Roller-Bearing Equalizer Slides.

MILL PIPING

Shaving and Sawdust Collecting Systems Installed Complete

ALTERATIONS—REPAIRS

Neville-Cooper Co.

130 Ontario St. Toronto

Phone Main 2157

We also manufacture and erect Smoke Stacks, Boiler Breechings, Metal Cornices, Skylights, Eavetrough, etc.

"Casco" for a better product

WATERPROOF GLUE

For Jointing and Veneering

STRONG - UNIFORM
USED COLD - EASILY PREPARED
ECONOMICAL

"CASCO" Uniformity is assured because we manufacture our own Casein. : : :

The Casein Manufacturing Company

Largest and Longest Established Manufacturers of Casein Products in America : : :

15 PARK ROW, - NEW YORK CITY

Write for "CASCO" Red Book—a manual on Veneers, Panel-Making and Glue.

Samples of "CASCO" on request.

Canadian Distributors

HART & LEFEBER, LTD.

38 Grey Nun, Montreal' Que.

FACTORY TRUCKS

Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY

P. E. SHANTZ, PRESTON, ONTARIO.

Factory Truck Style No. 26.

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

ECONOMY

THE kind of a man who demands glue for economy will be careful not to buy a glue that is low in quality also, even at a slight difference in price. One feature alone in Perkins Glue, Uniformity, is worth that difference.

The satisfaction of knowing that the glue used today is as dependable as that used last week, and what will be used next month will be as reliable, is a source of pleasure.

As one large manufacturer said, when discussing glues, "I buy Perkins, charge the price to the cost of materials and forget all about the glue-room problems," which was the same as saying that he had no more "costs" to charge up to manufacturing his panels because of loose veneers, blisters, etc., either in the plant or after his goods had been shipped.

PERKINS GLUE COMPANY

Factory and General Offices
Lansdale, Pennsylvania

Sales Office
South Bend, Indiana

"Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries."

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

Upholstered Furniture Manufacturers Attention!

The Construction

of our

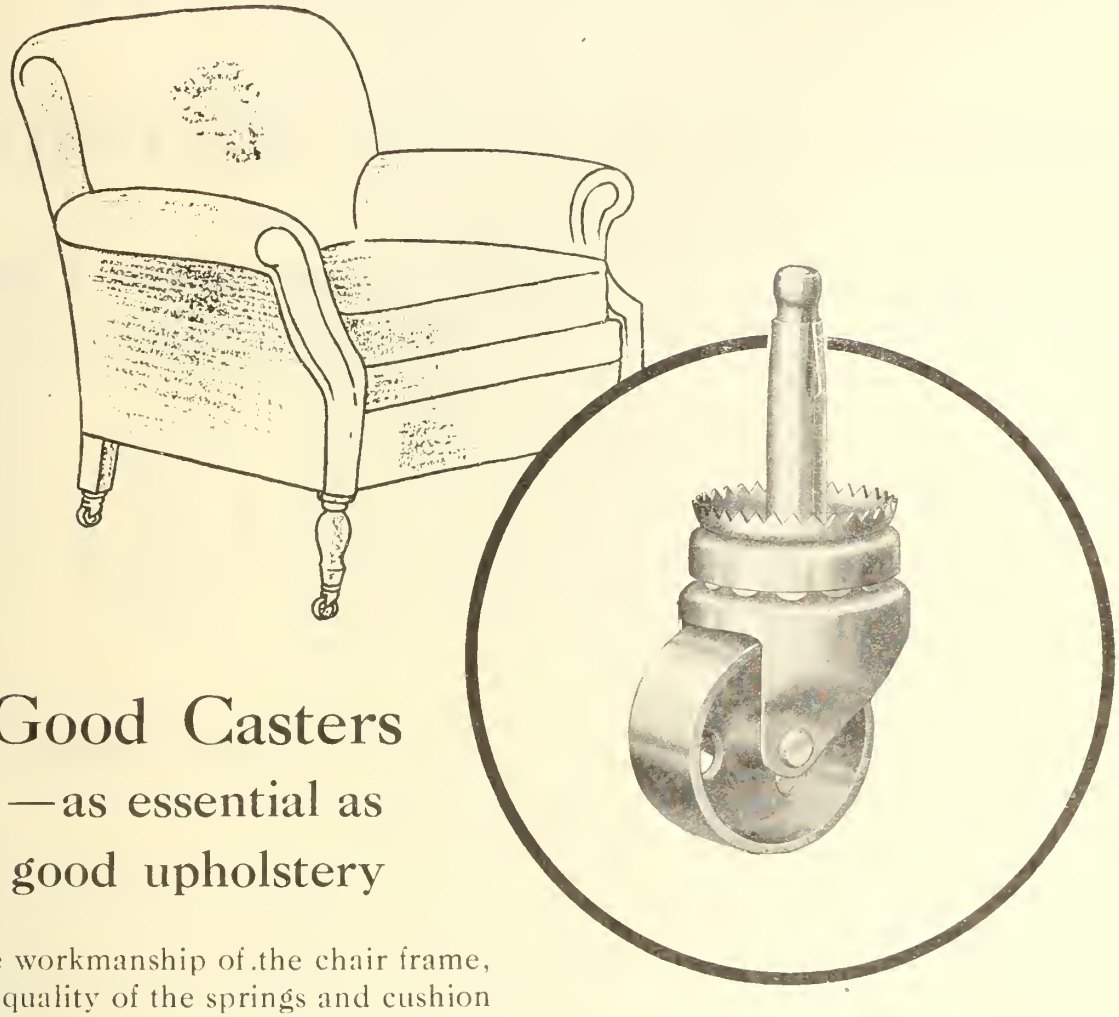
Square Foot

is consistent with the demands of the heaviest Chesterfield.

They will stand the roughest usuage, and will add to the attractiveness of your goods. Last but not least they are reasonable in price

J. WALTER & SONS LIMITED

KITCHENER :-: ONTARIO



Good Casters

—as essential as good upholstery

The workmanship of the chair frame, the quality of the springs and cushion material, the durability and beauty of the fabric are highly important to the finished product.

Equally responsible is the easy-rolling long-lived caster for hundred per cent. perfection in the chair.

And it is equally so in all the other furniture that goes into home or office.

There's an Efemco Caster for every need.

Send for our latest catalog

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters

Roller Bearing Casters
Truck Casters
Automobile Accessories

Piston Rings
Grey Iron Castings

Standardized ... 57 years of service.

SAM D. SMITH

Wholesale Dealer and Manufacturer in

NORTHERN and SOUTHERN HARDWOODS

305 Kent Building, Toronto

Specialty—Sawing Dimenison Stock to Order

OPENKOTE

Garnet Finishing

Costs no more than any other

Send for samples at no cost to you

THE "OPENKOTE" PROCESS is our invention. All Garnet grains are arranged scientifically to create "valleys"—spaces between kernels—for dust clearance, longer wear, even surface, no sand on top of sand, no scratches, less bulk, greater flexibility.

It's the "finishing touch" in sandpaper—Be sure and say -- Behr's Openkote.

Every kernel of sand is an Imp of Efficiency eager to work for you.

HERMAN BEHR & CO., INC.

In business Fifty Years 1872 - 1922

31-63 TIFFANY PLACE
BROOKLYN-NEW YORK CITY

CANADIAN·NASHUA·PAPER·CO·LTD
SERVICE INNOVATION NASHUA QUALITY
TRADE MARK
PETERBOROUGH ONT.

Buy Nashua Veneer Tapes

(Paper and Cloth)

QUALITY SUPREME

SERVICE UNEQUALLED

THE CANADIAN NASHUA PAPER CO., Ltd.

Peterborough, Ont.

We Especially Invite Orders, on the Following Stock:

17,000′ 4/4″ Fas Plain White	$ 115.00	per M′
57,450′ 4/4″ No. 1 Com & Sel same	65.00	" "
11,230′ 4/4″ Fas Plain Red Oak	113.00	" "
32,670′ 4/4″ No. 1 Com & Sel same	62.50	" "

These prices are f.o.b. Toronto rate and we will protect same until April 10, 1922.

In addition to the above, we have a desirable stock of gum, both red and sap, and invite your correspondence.

GENERAL HARDWOOD LUMBER COMPANY

118 North La Salle Street - - - - - CHICAGO, ILL.

Quality Lumber guarantees value received

Beautiful Birch

For many years it has been our pleasure to supply Canadian furniture maufuacturers with beautiful birch.

The above is a sample of the craftmanship produced in the shops of Krug Bros. from Birch supplied by us.

These hardwoods are manufactured by skilled millmen of long experience and afterwards graded to the most rigid standards. Our trade mark is the buyer's guarantee of quality.

How are your stocks at the moment? With prices at their present level, we cannot too strongly urge the placing of orders now. A good plan is to place an order for the next six months, giving instructions as to the various shipping dates.

What are your requirements for 4/4 Birch? We have on hand 1,000,000 feet of dry 4/4 Birch. No. 2 Common and Better for immediate shipment at attractive prices.

Manufacturers and Wholesalers of Northern Hardwoods

Specialty E C & S Birch

Efficiency, Courtesy and Service.

Edward Clark & Sons, Limited

807-9 Bank of Hamilton Bldg. Toronto

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut
Mahogany, Teak, Oak
Ash, Cypress

ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

The McLennan Lumber Co.
Limited

MONTREAL

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co.
Orillia, Ontario

Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.—58,000
1¼ in.— 3,500
1½ in.—

CHERRY

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
1 in.	44,500	.....	203,900	18,500
1¼ in	4,900	.....	37,600	7,500
1½ in.	2,000	.....	34,700	36,300
2 in.	6,000	.....	22,200	61,900
2½ in.	5,500	.....	4,300	2,200
3 in.	25,700	.....	6,500	3,300
4 in.	4,000	.....	900	400

CHESTNUT

	1 & 2	Clear Strips.	No. 1 Com.	S.W. & No. 2 Com.
¾ in.	500	.....	56,000	91,000
1 in.	11,000	500	45,000	1,000
1¼ in.	66,800	300	100,200	159,200
1½ in.	34,500	.....	40,000	.....
2 in.	2,200	.....	15,300	89,200
2½ in.	4,000	.....	1,500	.....
3 in.	1,100	.....	1,000	500
4 in.	1,500	.....	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
½ in.	6,500	.....	.....	.....
¾ in.	900	300	23,600	9,000
⅝ in.	2,800	.....	5,500	800
1 in.	17,300	10,000	52,400	27,000
1¼ in.	5,000	.....	6,000	.....
1½ in.	600	.....	2,400	.....
2 in.	.....	.....	25,100	5,700
2½ in.	2,000	.....	400	.....
3 in.	2,000	.....	1,300	.....
4 in.	2,500	.....	1,700	.....

PLAIN WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	1,000	.....	.....	.....
½ in.	100	.....	.....	.....
⅝ in.	2,150	.....	8,000	16,900
¾ in.	274,800	.....	453,800	122,000
1 in.	42,300	1,700	78,000	85,200
1¼ in.	6,300	.....	15,100	.....
1½ in.	51,300	.....	84,000	12,000
2 in.	29,000	.....	125,000	54,000
2½ in.	152,800	.....	69,500	3,000
3 in.	55,800	.....	75,800	14,400
3½ in.	4,500	.....	4,000	1,500
4 in.	65,000	.....	38,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	24,200	.....	.....	.....
¾ in.	170,000	.....	327,000	65,800
⅝ in.	2,400	.....	77,000	42,600
1 in.	30,200	3,150	56,000	125,400
1¼ in.	11,700	2,400	16,600	.....
1½ in.	138,900	4,300	46,200	32,000
2 in.	91,500	.....	162,000	71,000
2½ in.	70,100	.....	26,000	3,700
3 in.	23,800	.....	20,500	7,000
4 in.	16,600	.....	10,900	.....

QUARTERED RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
¾ in.	1,700	.....	9,700	500
1 in.	10,200	5,400	7,500	1,400
1¼ in.	2,000	.....	.....	.....
1½ in.	.....	.....	.....	.....
2 in.	.....	.....	7,400	.....

SAP GUM

	1 & 2	Strips.	No. 1 Com.	No. 2 Com.
1 in.	.....	16,000	21,000	.....
1¼ in.	.....	.....	.....	.....
1½ in.	.....	2,400	6,000	13,500
2 in.	.....	.....	5,700	10,400
2½ in.	.....	.....	.....	.....

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	20,000	9,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

	No. 1	No. 2
1 in.	16,300	10,900	9,500
1¼ in.	6'000	8,325	.....
1½ in.	12,000	13,300	9,500
2 in.	9,000	3,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	2,000	6,000	7,000
5/4	9,400	10,800	.....
6/4	8,900	5,500	4,600
8/4	1,300	19,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No.2 Com.
⅝ in.	18,000	15,800	31,300	800
1 in.	27,000	5,200	91,900	.....
1¼ in.	22,300	360	5,700	6,000
1½ in.	19,100	13,000	29,000	7,500
2 in.	15,000	.....	10,500	24,500
2½ in.	10,800	6,000	.....	.....
3 in.	17,900	.....	11,400	47,000
4 in.	6,500	.....	300	450

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y.

Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

British Columbia Lumber Commissioner

Display rooms and offices have been removed to 51 YONGE STREET (Ground floor

where a complete display of British Columbia forest products will be installed, including several rooms to full scale, finished in BRITISH COLUMBIA WOODS and completely furnished, showing exterior walls and roof of British Columbia red cedar with thatched roof effect. Also, a complete display of every grade of all British Columbia woods in commercial sizes and a complete line of British Columbia boxes and RED CEDAR SHINGLES.

You are cordially invited to call and see our exhibit.

Main 6872 TORONTO 51 Yonge St.

Mr. J. H. Barclay

Member of our firm en-route to Canada, and will no doubt call on you in the interests of our company.

Any orders given him will be satisfactorily handled and you may rest assured that they will be properly taken care of and all consideration extended him will be greatly appreciated.

R. R. May Hardwood Co.
1522 South Sixth Sts.
Louisville, :-: Kentucky

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

DRY STOCK

For Immediate Shipment

SOFT ELM		
6905′	1″	—No. 1 C&B
3195′	1″	—No. 2 Com.
41030′	1½″	—No. 1 C&B
2356′	1½″	—No. 2 Com.
56880′	2″	—No. 1 C&B
10046′	2″	—No. 2 Com.
110594′	2½″	—No. 1 C&B
26985′	2½″	—No. 2 Com.
11750′	3″	—No. 2 Com.
WHITE ASH		
87846′	2″	—No. 1 C&B
3072′	2″	—No. 2 Com.
139960′	2½″	—No. 1 C&B
13587′	2½″	—No. 2 Com.
18992′	3″	—No. 1 C&B
608′	8″	—No. 2 Com.
HICKORY		
650′	1″	—No. 1 C&B
1408′	2″	—No. 1 C&B
COTTONWOOD		
1620′	1″	—No. 1 C&B
19956′	2″	—No. 1 C&B
1196′	2″	—No. 2 Com.
BLACK WALNUT		
2878′	1″	—No. 1 C&B
1151′	1″	—No. 2 Com.
WILLOW		
1446′	1″	—No. 1 C&B
CHERRY		
4747′	1″	—No. 1 C&B
2137′	1″	—No. 2 Com.
ROCK ELM		
12498′	2″	—No. 1 C&B
SOFT MAPLE		
14897′	2½″	—No. 1 C&B
BASSWOOD		
1549′	1″	—No. 1 C&B
606′	8″	—No. 1 C&B
BUTTERNUT		
2584′	1″	—No. 1 C&B
HARD MAPLE		
31788′	1″	—No. 1 C&B
248927′	1¼″	—No. 1 C&B
227707′	1½″	—No. 1 C&B
1796′	1½″	—No. 2 Com.
217401′	2″	—No. 1 C&B
11410′	2″	—No. 2 Com.
38016′	2½″	—No. 1 C&B
11091′	3″	—No. 1 C&B
2796′	4″	—No. 1 C&B
BEECH		
3000′	1½″	—No. 2 Com.
500′	2″	—Log run
250′	2½″	—Log run
350′	3″	—Log Run
100′	4″	—Log run
BIRCH		
15998′	1″	—No. 1 C&B
22311′	1¼″	—No. 1 C&B
11748′	1½″	—No. 1 C&B
50157′	2″	—No. 1 C&B
87172′	2½″	—No. 1 C&B
7866′	3″	—No. 1 C&B
PLAIN OAK		
9869′	1″	—No. 1 C&B
1107′	2″	—No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVENUE : : TORONTO

Full or mixed cars for immediate delivery

HARD and SOFT MAPLE **ROCK and SOFT ELM**
BEECH BIRCH and BASSWOOD

Hardwoods in 4 x 4, 4 x 6, 1″ and 2″. No. 3 Common.

Why not get in touch with us?

McDonagh Lumber Co.

203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods
Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

Calhoun Plywood Company

Panels Tops Counter Fronts

OPERA CHAIRS
in the White or finished.

Vegetable or Waterproof Glue.

Sheboygan - Wisconsin

FOR IMMEDIATE SHIPMENT

10 cars 4/4 No. 2 C & B. Birch
4 cars 5/4 No. 1 C & B. Birch
5 cars 6/4 No. 1 C & B. Birch
7 cars 8/4 No. 1 C & B. Birch
2 cars 10/4 No.1 C & B. Birch
3 cars 12/4 No. 1 C. & B. Birch
3 cars 16/4 No. 1 C & B. Birch
4 cars 8/4 No. 2 & No. 3 Com. Birch
20,000 ft. 4/4, 5/4, 6/4, mostly 4/4 and 5/4 Canadian Cherry No. 1 C & B. 6/14 inches wide.
40,000 ft. 4/4 No. 1 C & B. Basswood
30,000 ft. 6/4 FAS. Maple, very choice stock
400,000 ft. 1 x 3 and up Spruce Crating
200,000 ft. 2 x 3 and up Spruce Crating
400,000 ft. 5/8 x 3 and up Spruce Crating

Write, Wire or Phone Inquiries

PERCY E. HEENEY

Office: 298 Breithaupt St., KITCHENER, ONT.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft.....8/4 No. 1 Com.

Band-mills at Baton Rouge, La., Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.
BAY CITY - - MICHIGAN

Try a Carload-straight or mixed

Soft Oak, plain and quartered
Poplar, Walnut, Chestnut,
Ash and other Hardwoods

LELAND G. BANNING

Cincinnati, Ohio, Bandmill at Frankfort K Y.

Get in touch with our representative

Canadian Representative: A. E. Klippert, 11 Laxton Avenue, Toronto, Ontario

H. J. RICHARDS J. T. KENDALL

Richards Hardwood Company

746-7 BANK OF COMMERCE BUILDING

Memphis, Tennessee, U. S. A.

Successors to Dacus-Richards Hardwood Co.

We make a specialty of catering to the Canadian trade and are in position to make reasonably prompt shipment of practically any Southern Hardwoods which you are needing. Your orders and inquiries will be highly appreciated and will receive our prompt and personal attention.

Specializing in Delta Red and Sapgum, Oak, Elm and Poplar.

Miller Lumber Company

Marianna - Arkansas

QUARTERED WHITE OAK
300,000′ 4/4 No. 1 Com.
20,000′ 5/4 No. 1 Com.
8,000′ 8/4 No. 1 Com.
150,000′ 4/4 No. 2 Com.
2,000′ 5/4 No. 2 Com.

PLAIN WHITE OAK
70,000′ 4/4 FAS
13,500′ 5/4 FAS
300,000′ 4/4 No. 1 Com.
42,000′ 6/4 No. 1 Com.
35,000′ 8/4 No. 1 Com.
300,000′ 4/4 No. 2 Com.
11,500′ 5/4 No. 2 Com.
10,500′ 6/4 No. 2 Com.
20,000′ 8/4 No. 2

QUARTERED RED OAK
3,200′ 3/4 C & Btr.
150,000′ 4/4 Nos. 1 & 2 Com.
1,000′ 5/4 No. 2 C & Btr.
3,500′ 8/4 No. 2 C & Btr.

PLAIN RED OAK
75,000′ 4/4 FAS
13,500′ 5/4 FAS
5,000′ 8/4 FAS
600,000′ 4/4 No. 1 Com.
33,000′ 5/4 No. 1 Com.
11,000′ 6/4 No. 1 Com.
48,000′ 8/4 No. 1 Com.
600,000′ 4/4 No. 2 Com.
9,400′ 5/4 No. 2 Com.
3,000′ 8/4 No. 2 Com.

MISCELLANEOUS OAK
3,700′ 3/4 No. 2 C & B Qt. W. O.
5,000′ 4/4 Cl. Pl. RO Stps 3-5 1/2″
8,500′ 4/4 Cl. Pl. WO Stps 3-5 1/2″
7,300′ 5/4 Pl. RO Step Plk. 11″ & Wdr.
5,500′ 3/4 No. 2 C & B Pl. R & WO.
160,000′ 4/4 S.W. R & WO.
300,000′ 4/4 No. 3 Com.
20,000′ 5/4 No. 3 Com.
22,000′ 6/4 No. 3 Com.
12,000′ 8/4 No. 3 Com.
50,000′ 8/4 Bridge Plk. R & W
50,000′ 10/4 " " " fwd.
200,000′ 12/4 " " "

SYCAMORE
130,000′ 4/4 No. 2 C & B Qtd.
1,000′ 5/4 No. 2 C & B Qtd.
400,000′ 4/4 No. 1 C & B

QUARTERED RED GUM
25,000′ 5/4 No. 1 C & Btr.
15,000′ 6/4 No. 1 C & Btr.

PLAIN RED GUM
1,100′ 5/8 FAS
1,800′ 3/4 No. 2 C & Btr.
40,000′ 4/4 No. 2 Com.
3,300′ 8/4 No. 2 C & Btr.

SAP GUM
4,200′ 4/4 Pnl & No. 1 18″ & Up
50,000′ 4/4 Clr strips 3-5 1/2″
20,000′ 4/4 No. 1 C stps 2-5 1/2″
125,000′ 4/4 Box Bds. 9-12″
150,000′ 4/4 Box Bds. 13-17″
6,500′ 5/4 No. 1 Com.
50,000′ 6/4 No. 1 C & Btr.
6,000′ 8/4 No. 1 C & Btr. Qtd.
9,500′ 8/4 No. 1 C & Btr. Qtd. Stps

TUPELO
50,000′ 4/4 FAS 6-12″
5,000′ 4/4 FAS 13-17″
5,000′ 4/4 No. 1 Com. 13-17″
12,500′ 4/4 Box Bds. 9-12″
3,700′ 4/4 Box Bds. 13-17″

COTTONWOOD
100,000′ 4/4 FAS 6-12
30,000′ 4/4 FAS 13-17″
15,000′ 4/4 pnl & No. 1 18″ & Up
40,000′ 4/4 Box Bds. 9-12″
30,000′ 4/4 Box Bds. 13-17″
150,000′ 4/4 No. 1 Com.
100,000′ 4/4 No. 2 Com.

MAPLE
40,000 4/4 No. 2 C & Btr.
50,000′ 5/4 No. 2 C & Btr.
75,000′ 6/4 No. 2 C & Btr.
20,000′ 10/4 No. 2 C & Btr

CYPRESS
20,000′ 4/4 FAS
9,000′ 5/4 FAS
10,700′ 6/4 FAS
20,000′ 8/4 FAS
250,000′ 4/4 No. 1 Shop
15,000′ 8/4 No. 1 Shop
30,000′ 5/4 No. 1 Com.

Thomas & Proetz Lumber Co.

3406 N. Hall St.

ST. LOUIS, MO.

BELZONI, MISS. —— MILLS —— CALION, ARK.

Com. & Btr. Quartered White Oak
1″ —925,000 ft.
1¼″—335,000 "
1½″—115,000 "

Com & Btr. Quartered Red Oak
1″ —380,000 ft.
1¼″—150,000 "
1½″—275,000 "

Com. & Btr. Plain Red Oak
1″ —150,000 ft.

Com. & Btr. Plain White Oak
1″ —150,000 ft.
1½″—250,000 "

Com & Btr. Red Gum Plain & Quartered
1¼″—300,000 ft.
2″ —500,000 "
2½″—235,000 "
3″ —180,000 "

Com. & Btr. Sap Gum
1″ —350,000 ft.
1¼″—433,000 "
1½″—750,000 "
2″ —980,000 "
2½″—170,000 "
3″ —350,000 "

Com. & Btr. Quartered Black Gum
1″ —290,000 ft.

Com. & Btr. Tupelo
1″ —235,000 "

We have MILLIONS of Feet

of AMERICAN Walnut Veneers
Longwood and Choice Butts

of FIGURED Mahogany Veneers
For the FURNITURE PIANO and WOOD-WORKING TRADE

Plain Veneers for Drawer Bottoms

Also a Complete Stock of
MAHOGANY LUMBER
Ready for Prompt Shipment

of POPLAR Gum and Oak Veneers

We have been supplying the Furniture Trade and allied industries since 1843, with material direct from stump to consumer.

Our stock is A-No. 1 for quality and all orders are executed promptly and accurately.

LEWIS THOMPSON & CO., Inc. Offices: 49th and Botanic Ave., Phild. Yards: New Orleans, Phild., New York

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

AMERICAN WALNUT
"The Cabinet-wood of the Ages."

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

THEY LIKE WALNUT

It is largely due to our persistent and steadily increasing national campaign of advertising, as well as to the superior merits of the wood itself, that the almost universal preference is for American Walnut for furniture, paneling, trim, etc., in good buildings of all types.

This is "The American Walnut Period"—and it will be a long one—a market fact of which progressive manufacturers of fine furniture are keen to take all proper advantage.

Write for a copy of the Walnut book, which is carrying the message of Walnut to the home, architect, furniture trade and woodworker. Sent free.

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION
ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO, U. S. A.

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	0/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

On hand for immediate shipment

FURNITURE DIMENSION:

Clear Red Gum	1 car	2½ x 2½-30"	M
Clear Sap Gum	1 "	2 x 2 -19"	D
	2 "	2 x 2 -30"	D
	2 "	2½ x 2½-30"	M
	1 "	2 x 2 & 2½ x 2½-30"	D
Clear W. & R. Oak	2 "	2 x 2 -19"	M
	2 "	2 x 2 -20"	D
	1 "	1½ x 1½-19"	D
	1 "	1 x 2 -16 & 30"	D
Clear Ash	1 "	1¾ x 1¾ & 2 x 2-38, 44 & 50"	D
	1 "	1-1/8 x 1-1/8-7'	

HARDWOOD LUMBER

1 car	5/4 No. 1 Com. & Btr. Qtd. Red Gum
1 "	4/4 FAS Pl. Sap Gum
2 "	4/4 No. 1 Com. Pl. Sap Gum
1 "	4/4 No. 1 Com. Pl. W. & R. Oak
1 "	No. 1 Com. Pl. Red Oak
2 "	4/4 FAS Cottonwood
1 "	10/4 Log Run Soft Elm
1 "	4/4 Log Run Soft Elm

We can furnish your requirements in square or flat dimension. Let us have your specifications.

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office Dimension Mill & Yard
Belt Line at McLean.

MEMPHIS - TENN.

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated **General Office, NEW ORLEANS, U.S.A**

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

MILLS AT EVANSVILLE, IND., GRAMMER, IND., and KEIRNS, MISS.

STOCK LIST ENCLOSED

PLAIN SAP GUM

10,000 ft. 5/8 in. 1 & 2
25,000 " 1 " "
15,000 " 1¼ " "
13,000 " 1¼ " 15" to 17"
71,000 " 1½ " "
11,000 " 2 " "
13,000 " 1 " Box Boards 13 to17"
102,000 " 5/8 " No. 1 Common
80,000 " 1 " No. 1 "
24,000 " 1¼ " No. 1 "
77,000 " 1½ " No. 1 "
52,000 " 2 " No. 1 "
20,000 " 1 " No. 2 Common
10,000 " 1½ " No. 2 "

QUARTERED RED GUM
(Sap no Defect)

40,000 ft. 1¼ in. 1 & 2
4,000 " 1½ " "
65,000 " 2 " "
83,000 " 2½ " No. 1 C&B.
227,000 " 3 " No. 1 C&B.
13,000 " 1 " No. 1 Common
119,000 " 1¼ " No. 1 "
40,000 " 1½ " No. 1 "
143,000 " 2 " No. 1 "

QUARTERED WHITE OAK

154,300 ft. ½ to 2½ in. 1 & 2
73,000 " 1 in. No. 1 Com. 1½ to 2½"
114,000 " ½ & 5/8 in. No. 1 Com.
101,000 " ¾ in. No. 1 Com.
268,000 " 1 " No. 1 "
202,000 " 1¼, 1½ & 2" No. 1 Com.
124,000 " 1, 1¼ & 1½" No. 2 Com.
4,900 " 3 to 4 in. No. 1 C&B.
75,000 " 1 in. Clear Strips, 2½ to 5½ in.
25,000 " 1 in. Clear Sap, 2 to 3 in.

QUARTERED RED OAK

29,000 ft. ½ & 5/8 in. 1 & 2
115,000 " 1, 1¼, 1½, 1¾ & 2 in. 1 & 2
43,700 " 1 to 2 in. 1 & 2, 9" & up
117,400 " 5/8 to 1½ in. No. 1 Com.
15,000 " 1 in. No. 1 Com. Stps., 1½ to 3"
20,000 " 1 in. Clear Strips, 2 to 5½ in.
26,000 " 1, 1¼ & 1½ in. No. 2 Common.

PLAIN WHITE OAK

27,200 ft. 1, 1¼, 1½ & 2½ in. 1 & 2
11,000 " 2½ in. No. 1 C&B
218,000 " 5/8 & 2½ in. No. 1 Com.
44,600 " 1 & 1¼ in. No. 2 Com.

PLAIN RED OAK

121,000 ft. 1 1¼, 1½, 2 & 2½ in. 1&2
10,000 " 2½ in. No. 1 C&B.
71,500 " ½, 5/8 & ¾ in No. 1 C.
246,000 " 1 to 2½ in. No. 1 Com.
101,200 " 1 1¼, 1½ & 2 in. No. 2 Com.
80,000 " 1 in. Sound Wormy Oak

PLAIN RED GUM

5,200 ft. 1½ in. 1 & 2
14,000 " 1 " No. 1 Common.
16,230 " 1¼ " No. 1 "
17,000 " 1½ " No. 1 "
16,000 " 1 " No. 2 "

QUARTERED RED GUM

3,000 ft. 1¼ in. 1 & 2
6,000 " 1¼ " No. 1 Common.
3,760 " 2 " No. 1 "
6,790 " 1½ " No. 1 "

ASH

63,000 ft. 5/8, 1, 1¼ & 1½" 1 & 2
8,000 " 1 in. 1 & 2, 10" & up
244,800 " 1½ to 5 in. No. 1 C&B
159,000 " 5/8, 1, 1¼, 1½ & 2 in. No. 1 Com.
120,000 " 5/8, 1, 1¼, 1½ & 2 in. No. 2 Com.

POPLAR

12,000 ft. 1 in. Box Bds., sap no defect. 12 in. & wdr.
70,000 " 1 & 1¼ in. 1 & 2, Yellow
35,000 " 5/8 in 1 & 2 sap no defect
115,000 " 1 to 3 in. 1 & 2 sap no "
18,000 " 5/8 in. 1 & 2, sap no " 12 in. & wdr.
12,000 " 1½ in. 1 & 2, sap no " 12 in. & wdr.
65,000 " 5/8 & ¾ in. No. 1 Com.
208,000 " 1 in. No. 1 Com.
117,000 " 1¼, 1½, 2 & 2½ in No. 1 Common.
25,300 " 5/8 & ¾ in. No. 2 Com.
172,000 " 1 in. No. 2 Com.
150,000 " 1¼, 1½ & 2 in. No. 2 C.

WALNUT

1,100 ft. ½ & 5/8 in. 1 & 2 & Sel.
19,900 " 1¼ to 4 in. 1 & 2 & Sel.
15,400 " ½ & 5/8 in. No. 1 Com.
33,500 " 1¼, 1½, 1¾ & 2 in. No. 1 Common.
21,800 " ½, 5/8, & ¾ in. No. 2 C.
28,800 " 1, 1¼, 1½ & 2 in. No. 2 Common.
16,000 " 5/8 in. Log Run.

TUPELO

45,000 ft. 1 in. 1 & 2
48,000 " 1 " Box Bds. 13 to 17"
1,000 " 1 " Panel 18 in. & up
3,185 " 1 " No. 1 Common

CYPRESS

22,384 ft. 2 in. 1 & 2
10,800 " 1 " Selects
9,020 " 2 " Select
6,000 " 1 " No. 1 Common
3,000 " 2 " No. 1 "
22,560 " 1 " No. 1 Shop
31,560 " 2 " No. 1 Shop
7,320 " 1 " No. 2 Common
3,720 " 2 " No. 2 Common

MISCELLANEOUS

106,000 ft. 1, 1¼, 1½ & 2 in. Qtd. Bl. Gum, No. 1 C&B
41,000 " 1 in. Black Gum, Log Run
130,000 " 1, 1½, 2 & 2½ in Hickory, L.R.
58,000 " 1 in. Basswood Log Run
163,000 " 1 to 3 in. Hard Maple Log Run
151,000 " 1 to 3 in. Soft Maple Log Run
248,000 " 1 to 4 in. Elm, Log Run
13,200 " 1 & 2 in Cherry Log Run
110,000 " 1, 1½ & 2 in Beech L.R.
142,000 " 5/8 to 2½ in. Pl. Sycamore, L.R.
87,400 " 5/8 1, & 2" Qtd. Syc.
10,000 " 2 in. Cypress, Shop & Better
116,000 " 1 in. Cypress Log Run.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

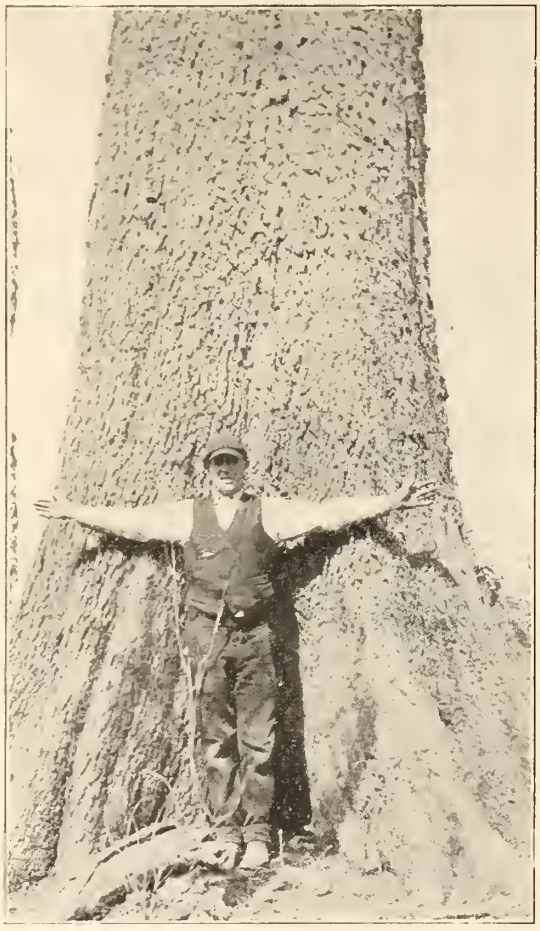
A few Specials :

130,000 ft. 4/4 No. 1 and No. 2 Common Qtrd. White Oak
65,000 ft. 4/4 No. 1 and No. 2 Common Plain White Oak
100,000 ft. 4/4 No. 1 and No. 2 Common Poplar

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Attention Hardwood Buyers!



The Spring Trade Revival

Building permits are running larger than for many years, forecasting a brisk Spring trade by the lumber consumer. Have you covered your Spring requirements?

Upper grades of HARDWOODS are scarce and getting scarcer. DO IT NOW!

Wire Our Expense for Price Quotations

Chapman & Dewey Lumber Company

MEMPHIS Tennessee

Why Bruce Hardwoods Excel

For many years before we became hardwood lumber manufacturers, we were makers of fine Oak Flooring and are to-day the largest individual producers of that material.

The producing of good Oak Flooring is an exacting science—where perfection is attained—and teaches the value of both skilful grading of raw material and accuracy in milling.

With a full appreciation of the value of these factors, we entered also upon the manufacture of southern hardwoods and in the operation of this department, have applied them in the production of all items in white and red oak, gum, ash and other species.

With our joint facilities, we are equipped to ship square edge parquetry strips, oak trim and mouldings, as well as Oak Flooring in the same car with hardwood lumber.

Inquiry and correspondence invited.

E. L. BRUCE COMPANY

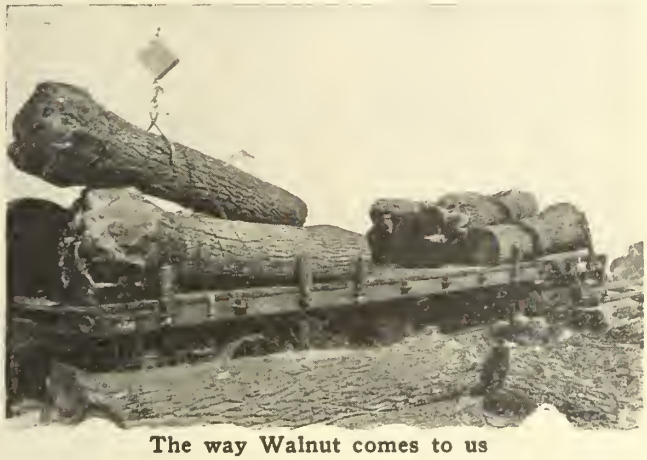
MANUFACTURERS

MEMPHIS, TENN.

Band Mill: LITTLE ROCK

Oak Flooring Plants: MEMPHIS; LITTLE ROCK

"Hartzell's Choice Walnut"



The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

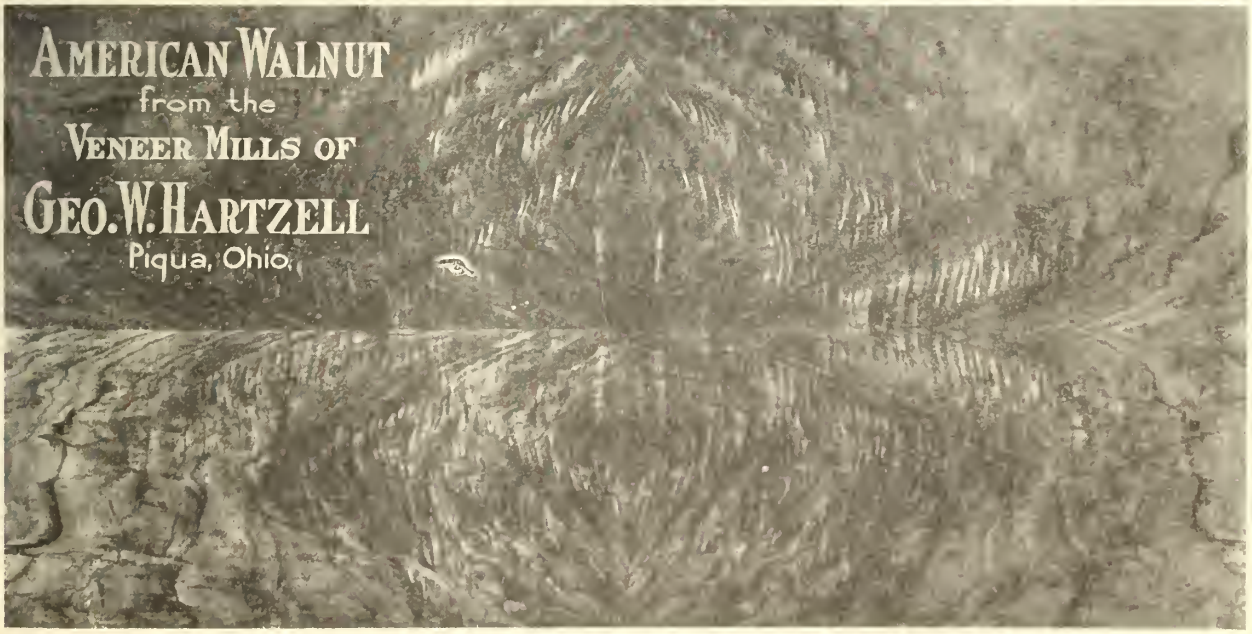
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manu facture.

Oak Timbers and Planking

The **Mowbray & Robinson Co.**
(INCORPORATED)
Manufacturers
Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative:
A. K. Johnson, Traders Bank Building, Toronto, Ont

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE
Kansas City - Kansas

ELM MAPLE

FOR SALE **RUSH LUMBER COMPANY** *FOR SALE*

GUM OAK

ASH POPLAR

QTD. WHITE OAK			
4-4	F. A. S.	2,000′	
4-4	F. A. S. 10″ & up	1,000′	
4-4	No. 1 Com.	15,000′	
4-4	No. 2 Com.	15,000′	
5-4	F. A. S.	14,000′	
5-4	No. 1 Com.	8,000′	
5-4	No. 2 Com.	4,000′	
6-4	No. 1 Com.	30,000′	
6-4	No. 2 Com.	20,000′	
8-4	F. A. S.	5,000′	
8-4	No. 1 Com.	3,000′	
PLAIN WHITE OAK			
4-4	No. 1 Com.	5,000′	
4-4	No. 2 Com	8,000′	

4-4	Sound Wormy .	25,000′	
4-4	No. 3 Com.	70,000′	
5-4	F. A. S.	2,000′	
5-4	No. 2 Com.	13,000′	
6-4	No. 1 Com.	2,000′	
PLAIN RED OAK			
3-4	No. 1 & 2 Com.	70,000′	
4-4	F. A. S.	2,000′	
4-4	No. 1 Com.	10,000′	
4-4	No. 2 Com.	20,000′	
5-4	F. A. S.	7,000′	
5-4	No. 1 Com.	15,000′	
5-4	No. 2 Com.	3,000′	
QTD. RED GUM			
4-4	F. A. S.	7,000′	

4-4	No. 1 Com.	13,000′	
5-4	F. A. S.	2,000′	
6-4	F. A. S.	3,000′	
6-4	No. 1 Com.	14,000′	
RED GUM S. N. D.			
8-4	No. 1 C&B. ...	70,000′	
10-4	No. 1 C&B. ...	40,000′	
SAP GUM			
5-8	No. 2 Com.	7,000′	
5-4	F. A. S.	1,000′	
5-4	F.A.S. 13″ & Up	4,000′	
5-4	No. 1 Com.	9,000′	
6-4	F. A. S.	11,000′	
6-4	No. 1 Com.	6,000′	
6-4	No. 2 Com.	4,000′	

POPLAR			
4-4	No. 2 A Com. ..	25,000′	
4-4	No. 2 B Com. ..	35,000′	
5-4	Sel. & Bet.	9,000′	
5-4	Saps	3,000′	
5-4	No. 1 Com.	12,000′	
5-4	No. 2 A Com. ..	8,000′	
6-4	Sel. & Bet.	7,000′	
6-4	No. 2 Com.	12,000′	
8-4	Sel.	3,500′	
8-4	Sap	8,000′	
8-4	No. 1 Com.	3,000′	
MISCELLANEOUS			
4-4	L. R. Qtd. B. Gum	25,000′	
4-4	L. R. Pln. B. Gum	25,000′	

MEMPHIS, TENN.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

Mills: Coal Grove, Ohio

General Offices: 33 Rector St. New York City

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. Submit your enquiries to our Sales office, Cincinnati, Ohio

WAYNE LUMBER CO.

Manufacturers and Wholesalers

American and Canadian
Hardwoods

Birch and Maple—Our Specialty

Special items we want to move:
1 car 2″ Basswood Log Run
Soft Elm, 70,000′ 1″ Log Run
Soft Elm, 70,000′ 2″ Log Run
Soft Elm, 24,000′ 3″ Log Run
1 car 5/4 No. 2 Com. Maple
2 cars 2″ No. 1 Com. & No. 2 Com. Maple

110 West 40th St. New York

Canadian Representative,
D. Cote, 730A Champagneur, Outremont, Montreal

BEDNA YOUNG
Lumber Company

Jackson - Tennessee

Manufacturer of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for
High Grade Lumber
please let us have your enquiries.

HARDWOOD LUMBER

"A Quality you will admire"

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Kiln Dried Products

Our kiln at Owensboro is a thoroughly modern equipment for handling green or dry lumber with efficiency and entire satisfaction.

Our facilities enable us to give real service—straight or mixed carloads.

Try our soft textured and finely figured quartered-sawn red and white oak. It will please you.

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills: Owensboro; Campbellsville, Kentucky

D. E. Hewit
Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Southern Hardwoods

GUM - POPLAR - OAK

We take a just pride in turning out the very best lumber for the manufacture of high grade furniture.

A modern mill, experienced operators and rigid grading of the finished lumber is your guarantee of assured satisfaction.

Test Our Service

Memphis Band Mill Company

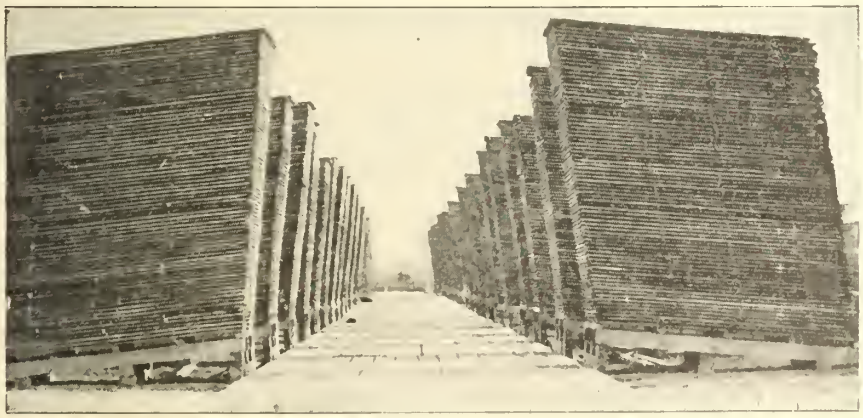
"Makers of high grade lumber"

QUALITY

Memphis - Tennessee

SERVICE

Efficiency Marks Every Step of Our Service to You



Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. **GREENFIELD, OHIO**

Buffalo for Hardwoods

"LET BUFFALO DO IT"

Buy and Sell Your Hardwoods in Buffalo

Do you want prompt shipment? We can give you service.
Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.
Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

Frank T. Sullivan
Specialities:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
Northern Grey Elm
and
Brown Ash
Niagara Street Cornor Arthur

ATLANTIC LUMBER COMPANY
HARDWOODS
West Virginia Soft Red and White Oak
Our Speciality: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller, Sturm & Miller
1142 Seneca Street
Hardwoods of All Kinds

YEAGER LUMBER CO., Inc.
SPECIALITIES
Oak, Poplar, Ash, Maple
932 Elk Street.

STANDARD HARDWOOD LUMBER COMPANY
HARDWOODS
Prompt Shipment { From Buffalo Yards or from mill direct to you
8 Million Feet Dry Stock on hand
1333 Clinton St.

G. Elias & BRO., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and fir timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B WALL Pres. T. H. WALL Vice-Pr.
M. M. WALL, Treasurer
940 SENECA ST.
We Specialize in White Ash, Oak, Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

HUGH McLEAN LUMBER CO.
Hardwoods of all Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

TAYLOR & CRATE
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

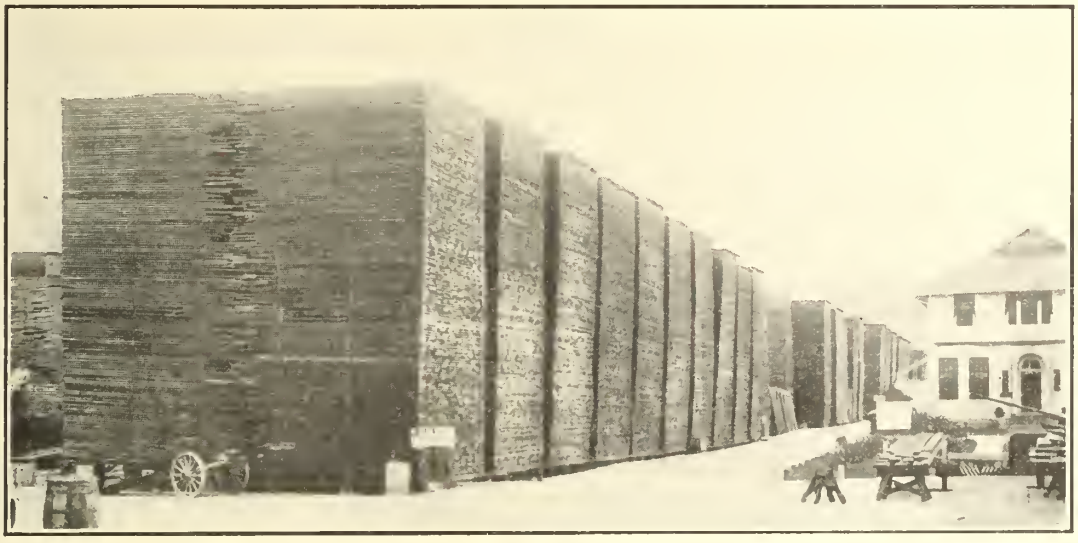
OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY



Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill — *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White OakVeneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

Sawed Veneer

Quartered White Oak

For Furniture and Panels

Plain Red Oak

For Interior Trim and Doors

Cypress

For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.

MEMPHIS, TENN.

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES—that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

Lumber

Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers

Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 38 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

ASH
OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

OUR EXPORT BRAND

Service LHC *Quality*

Prompt *Shipment*

SPECIAL
Plain White Oak
50 M' 1" FAS
30 M' 1¼" FAS
12 M' 1½" FAS
15 M' 2" FAS

SPECIAL
Plain White Oak
70 M' 1" No.1 C&S
20 M' 1¼" No.1 C&S
20 M' 1½" No.1 C&S
15 M' 2" No.1 C&S

GUM
ASH
OAK
POPLAR
CHESTNUT

LIVERPOOL HARDWOOD COMPANY Inc.

50 Church St. NEW YORK CITY
Bank of Commerce Bldg. MEMPHIS, TENN.

Ash Poplar Cypress

HAFNER

MANUFACTURING COMPANY

For Immediate Delivery

20 M ft. 4/4 F. A. S. Pl. Red Gum
50 M ft. 4/4 No. 1 Com. & Sel. Pl. Red Gum
50 M ft. 6/4 No. 1 Com. & Sel. Pl. Red Gum
60 M ft. 8/4 No. 1 Com. & Sel. Pl. Red Gum
30 M ft. 4/4 No. 1 Com. Qtd. Red Gum
120 M ft. 4/4 No. 1 Com. Sap Gum
60 M ft. 8/4 No. 1 Com. Sap Gum

35 M ft. 4/4 Saps & Sel. Poplar
40 M ft. 5/4 Saps & Sel. Poplar
60 M ft. 6/4 Saps & Sel. Poplar
30 M ft. 8/4 Saps & Sel. Poplar
75 M ft. 4/4 No. 1 Com. Poplar
10 M ft. 6/4 No. 1 Com. Poplar
50 M ft. 8/4 No. 1 Com. Poplar

ST. LOUIS, MO., U.S.A.

ESTABLISHED 1871

Oak Red Gum

WIS

SOFT TEXTURED

MISSOURI YELLOW CYPRESS

Anyone acquainted with Cypress knows that it is one of the most durable of woods and in the Missouri Yellow variety it works easily and has an attractive grain. In the lower grades our lumber is remarkably free of peck and shake, reducing waste to a minimum, and taking into consideration the fact that our grades are Supreme, the few Specials we list herewith should appeal to Industrials and the Retail Yard trade.

SPECIALS FOR IMMEDIATE SHIPMENT

			Months Dry	Average Width	14′ & 16′ Lengths
20,000′	4/4	1s & 2s	10	12″	80%
18,000′	5/4	1s & 2s	10	12″	80%
7,000′	8/4	1s & 2s	10	12″	90%
50,000′	6/4	Selects	10	8″	75%
100,000′	4/4	No. 1 Shop	10	8″	80%
200,000′	4/4	No. 1 C	8	7½″	85%
200,000′	4/4	No. 2 C	8	7″	80%
100,000′	4/4 x 9″	No. 1 C	8		90%
100,000′	4/4 x 10″	No. 1 C	8		90%
100,000′	4/4 x 8″	No. 2 C	8		90%
100,000′	5/4	No. 1 C	8	7½″	90%
100,000′	6/4	No. 1 C	8	7½″	90%

Note that each item shows number of months on sticks, approximate average widths and percentage, 14′ and 16′ lengths.

WRITE FOR VERY ATTRACTIVE PRICES

WISCONSIN LUMBER COMPANY

MANUFACTURERS SOUTHERN HARDWOODS

BAND MILLS
DEERING, MISSOURI

SALES OFFICE
CHICAGO, ILLINOIS

Dependable Shippers of American Hardwoods

KILN DRIED STOCK

A SPECIALTY

WEST VIRGINIA
OAK
CHESTNUT
WHITEWOOD
BIRCH

ARKANSAS
RED GUM
SAP GUM
OAK
ASH
ELM

The M. B. Farrin Lumber Co.

CINCINNATI, OHIO

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED
1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars.

All Canadian and American Hardwoods
Mahogany, Walnut, Veneers and Panels of every description
Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels
This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

EASTERN BRANCH—38 GREY NUN STREET, MONTREAL

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - - TORONTO
Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.
Subscription, $2.00 a year; foreign, $2.50.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 Toronto, March, 1922 No. 3

"I Never Thought of That"

Many readers of the "Canadian Woodworker and Furniture Manufacturer" have written in commenting on the special "Modern Methods Furniture Number" just published. One of the letters received is published elsewhere in this issue. This is not reproduced because it says anything particularly nice about the paper, other than offering congratulations for a commendable issue, but because it contains a message for every executive in the woodworking industry. This message is summed up in the following sentence:—"While our department heads are subscribers, we see that each issue of the "Canadian Woodworker" is placed on our club room table for the special benefit of all employees, who look forward to reading every issue.

"Our department heads are subscribers." The best trade paper ever printed would be practically useless if it was not read by those for whom it was published and conversely the poorest one would serve some good service in proportion to the number who read its pages. The greater the number of readers a trade publication commands, the greater the benefits which are derived from that paper. This applies equally to the industry covered as a unit or to the individual organizations which go to make up that industry.

A concrete case, the woodworking industry of Canada benefits from the "Canadain Woodworker and Furniture Manufacturer" in direct proportion to the number of readers this paper reaches. The individual woodworking plant benefits according to the number of readers found among its employees. Before a woodworking organization derives full value from the "Canadian Woodworker," the paper should reach the purchasing agent, the factory superintendent and each foreman, in addition to the management. In some of the more progressive plants this complete distribution is secured through the management subscribing for those who are most interested.

The "Canadian Woodworker and Furniture Manufacturer" is published solely in the interests of its readers. Its appeal is directly to managers, superintendents and foremen. The information and articles found in each issue are selected or prepared because they are considered to be instructive, helpful and interesting to those in authority. If a reader desires information on any particular phase of his work or would like to see articles published on a certain subject, he has only to write in and within reason his request will be complied with as fully as possible. This is one phase of the service offered which is not fully understood. If data or particulars covering any phase of woodworking would be of service, it may have to do with organization, equipment, method or material, the request for such information will receive a welcome and will be given prompt, courteous attention. Often when this suggestion is made, the reply is "I never thought of that."

Another phase of trade journal work is co-operation between subscriber or reader and publisher. J. H. Baetz, retiring president of the Furniture Manufacturers' Association, in addressing that organization, stated that the day of selfish, individualistic effort is rapidly passing and the day of co-ordination of effort or co-operation has dawned. There is no better way in which this idea can be carried out than through the columns of your trade journal. Ideas, suggestions, constructive criticisms and expressions of opinion made in this way have the widest possible circulation, reaching practically all who are interested, and thus the greatest amount of benefit is secured.

The old prejudice against giving out information has almost entirely disappeared. To-day practical men are willing to give freely of their experience. This is only as it should be for we no longer live to and for ourselves alone but are interested in helping the other fellow. To advance this attitude still further, the next logical step would be for every woodworker to take an active interest in the "Canadian Woodworker and Furniture Manufacturer" and voluntarily send in ideas and suggestions, vieing with each other in keeping the reading columns of your paper brimful of bright, practical ideas. In this event the truth of the parable about "casting thy bread upon the waters" would be demonstrated. Ideas can be given and at the same time be retained and used, and if this practice were to become general, where one idea is given hundreds would be received. A greater measure of co-operation between reader and publisher would prove of untold value to the whole woodworking industry. Are you willing to do your share?

Are You Prepared for Increased Business?

Vancouver Firm Equipped and Organized to Take Care of all Orders which Offer —Prepared to Cut in Lots of One Thousand—Large Stock of Milled Parts Kept Ahead—Find Business Improving

By Geo. S. Perry, Vancouver Editor

If and when, as a famous western politician used to phrase it, general business conditions return to a state of pleasing and wholesome activity, there is one manufacturing institution in the Pacific Province, which will be ready to take on all comers for furniture orders. When the management of the Restmore Manufacturing Company laid plans to expand with the upgrowth of the western provinces of Canada, and in particular the cities and communities located in British Columbia, they prepared for quantity production on a scale seldom exceeded in the manufacture of furniture. The company had an eye to the thousand towns on the western prairies where furniture stocks are carried, as well as to the British Columbia field. As one of the principals remarked: "We would rather make a thousand run of one line, than a hundred, and we are prepared for it. But we must get freight rates adjusted, and that is coming. When it does, and business becomes generally active, we will have the equipment and the facilities to meet the change."

"Our Department Heads Subscribe"

Owen Sound, March 1st, 1922.

Editor, Canadian Woodworker,

We are just in receipt of the "Canadian Woodworker and Furniture Manufacturer" (February issue) and you are to be congratulated on this instructive volume. While our department heads are subscribers, we see that a copy of each issue of the "Canadian Woodworker" is placed on our club room table for the special benefit of all our employees, who look forward to seeing every number.

Yours very truly,
North American Furniture Co., Limited.

Carry Milled Parts in Stock

"At present we make in hundreds, and often do not set up more than fifty at a time of any line. This is especially true in "case goods" for we lack sufficient storage space. But we are ready to set up fifties or hundreds because we carry the milled pieces in stock in thousand and five thousand lots."

Specializing for the past year in furniture made almost exclusively from native broad leaf maple (acer macrophyllum) the company has extended and improved its plant and premises to handle the product from the log, which is shipped in by rail, to the finished article of furniture shipped out crated, or loaded direct into a car at the factory siding. From the small saw mill at the rear of the plant, where the maple logs are sawn, the lumber is sent to be piled, or else put directly into the dry kilns. When seasoned the maple boards go to the milling floor, where planers, moulders, re-saws, lathes, and other machines operated at high speed, put through immense numbers of finished sections for every line that is turned out. From the milling floor stock is sent to be piled in storage space on the second, or assembling floor of the factory. It is here that the output of the factory can, if trade demands, be increased up to the capacity of the space available for men to work. As stated, the factory runs at the present time are usually fifty or one hundred. As one lot of dressing-cases, sideboards or stands is put together it passes either to the finishing floor, or to the top floor to be stored. If required for immediate deliveries a lot is finished at once. If not it is stored in the white to be drawn on as finished stock goes out.

Increases Efficiency of Service

Similar methods of organization apply in the steel bed factory and in the spring and mattress department. Steel blanks ready for making up in each style of steel bed, are carried in stock in large quantities. In the spring department, the plant as at present equipped can turn out from 100 to 125 coiled wire springs and from 150 to 200 woven wire springs per day. An equal number of Restmore mattresses can also be made daily. The result is that no matter what sort of an order comes in, whether for an assorted car-load or two items, the factory can meet the demand in the briefest possible time limit. Naturally the fine upholstered work is not organized on the quantity basis as the rest of the plant. This department devotes itself to every detail of upholstery and decoration including draperies and curtains.

During the year, the Restmore company has added to its manufacturing plant a double-end dovetailing machine, by which four pieces can be machined at one operation, thus virtually making a complete drawer in one operation. Anticipating brisker demand larger storage space for piled lumber has been secured adjoining the factory, an area over 175 feet wide being added, and this the company is now engaged in filling as it was originally tidelands. Compared with conditions a year ago demand has been surprisingly good, and rail and boat shipments both in car and l.c.l. lots have shown steady increase. The factory is operating with more hands than at this time twelve months ago.

Do You Believe in Future of Canada?

One of the largest and most conservative financial institutions in the U. S., is responsible for the following optimistic expression of opinion:

"We believe profoundly in the future of our country; nothing but blindness could suggest that our prosperity will not be greater than before. It requires little optimism to feel that the worst is past and that we are engaged in reconstruction. There should be early improvement ahead for those who have courageously put their houses in order and who are ready to pay by effort for their success.

"The times demand effort, not inactivity, but effort tempered by caution and guided by an appreciation of the conditions that now confront the world."

What to Do if You Want to Make Bigger Profits

First of a Series of three Articles Dealing with the Organization and Management of Woodworking and Furniture Plants

By L. G. Cattermole, Chief Industrial Engineer*

The woodworking industry has suffered, in the main, from a lack of legitimate profits, as we all know only too well. Mr. C. M. Bigelow, in his book "Installing Management Methods in the Woodworking Industry" has ascribed this in no small part to the lack of technical ability and trained leadership. Owners and managers in the industry, however, have ascribed the lack of trained ability to the fact that sufficient remuneration has not been available to reward it. Certain it is that had modern management and production methods been applied to this essential industry, a great many plants would be enjoying, now, much greater profits than they had ever dreamed of and the workers (than whom a finer group of skilled artisans does not exist) would be enjoying a much higher scale of wages than the comparatively small wages they are now, in a great many cases receiving.

A Few of the Features:

Standardization of parts and product.

Layout of machines and equipment.

Development of accurate costs.

Definition of manufacturing policy.

Provision for future expansion.

This article, while necessarily brief, must touch on various fundamentals relative to maximum production in the woodworking industry, in other words will emphasize the important elements in "organizing for work," as H. L. Gantt so aptly expressed it. A few pioneers in this industry have led the way, but there are still a large number of plants, which, by a knowledge of facts, and the developments of the proper methods and organization to take advantage of these facts, should show increased profits, better wages for the men, and a lowered selling price—bringing the product within the reach of a much larger circle of prospective customers.

There are, in general, two methods by which a plant can plan to obtain a high degree of effectuality. The first is by developing within the organization itself, modern production methods. The second is by retaining an outside firm of engineers, experienced in the particular industry, and skilled in the rapid installation of modern methods, to work with the plant organization. The first method is a good method, and far better than no method at all; but the experience of broad-minded managers and engineers over a long period of years, has proved that it is not so productive of results,—does not so nearly attain the 100% desired, as the second method. The reason for this is that a plant organization has a narrower vision, its experience does not cover so wide a field, and its ability to instal modern production methods is problematical. In the long run, setting the cost of one method against the cost of the other, it will unquestionably be found cheaper to have professional engineers perform the work, as they have been trained in the securing of results in the least possible time. A small plant which cannot afford the services of a resident engineer can often secure desirable results by securing advisory service of competent industrial engineers.

The competent engineer, in planning the development of improved methods for a plant, is guided by several elements of extreme importance—namely, simplicity, commonsense, practicability and local conditions. For that reason it is essential that he should have a sound knowledge of, backed by years of experience in, the woodworking industry.

It must be remembered that no single prescribed method of procedure can, in all cases, be adhered to. In general the main features covered are as follows, (not necessarily, however, in the order mentioned) each of which will be outlined in detail: 1. Classification and standardization of product, operations, machines, etc. 2. Layouts of machines and equipment, changes to conform to the best methods of routing; and to supervise the actual changes. 3. Compilation of all vital records relative to the manufacture of the product. 4. Inauguration of time study. 5. Installation of stores for shaped stock, part stock, patterns, templets, tools, jigs, etc. 6. Standardization. 7. Development and inauguration of planning methods. 8. Installation of wage incentive. 9. Development of correct cost methods. 10. Organization plans. 11. Final definition of manufacturing, sales, and financial policies. 12. Plans for future expansion.

It has been remarkable to note, in instance after instance, a complete change on the part of an organization, from the old time "let well enough alone" attitude, to an aggressive, fearless, conservative, fair and just attitude after the adoption of modern methods. Certain it is that fairness and justice cannot be administered without a knowledge of facts. Stiffening of the moral fibre, the "backbone" of the organization, must, however, come with the improved methods—as improvements in the mechanism of the organization will never take the place of the personal element, although increased broadness of vision comes from the new viewpoint.

For the purpose of analysis, to establish the most effective routing procedure, it is necessary to classify the product and operations. As this knowledge is compiled, it is posted onto "Layout Sheets," which are later used in the planning of work through the shop, and the making of instruction cards for the workmen. Symbolizing, or numbering, of parts and

*Cooley & Marvin Co., Chicago

operations serves to simplify and minimize clerical work.

The utilization of standard parts in various items of product, when done skillfully, lessens the cost of manufacture, without in any way "cheapening" the product. The designer should work in very close contact with the shop on this matter. There seems to be very little justification in having drawer sizes in a case-goods factory vary by one-quarter, three-eighths or one-half inch, or stretcher sizes in a chair factory vary by one-eighth inch in length. Such lack of standardization adds considerably to the cost, and it is doubtful if, in any manner whatsoever, it adds to the value of the product.

The standardization of operational sequence on various items of product enables the work to travel through the plant without "back-tracking," thus avoiding congestion, and facilitating the speed of manufacture. Some furniture manufacturers, whose routing problems have been particularly bad, have had the manufacturing cycle, or time-in-process of an order, cut from eight or nine weeks to six or seven weeks through the application of practical, operational-sequence procedure.

Layouts of Machinery and Equipment

After the above-mentioned operational sequence has been determined upon, it is necessary to make layouts of the machinery and equipment to conform to the same. This is generally done by the templet method—that is the cutting out, to scale, of all machines and equipment, and arranging them on the floor plans of the building to secure the maximum effectuality. This is, in itself, no small task, and calls for all the knowledge and experience of everyone who can shed even the smallest amount of light on the subject. It is desirable, as soon as these layouts have been completed and approved, to have the actual changes go forward as soon as possible, so that no delay will be occasioned when the installation of the wage incentive is started.

The problems of layout in a woodworking factory are peculiar, in a great measure, to this industry alone. The layout of the yard for the proper storage of the lumber; the location of the kilns with respect to the yard layout and the mill; the layout of the cutting room with proper cut-off equipment and sufficient storage space for cut stock; proper parking space for trucks of work-in-process; the development and layout of the most effective methods for driving-up or assembly; the development and layout of the equipment for the most rapid and highest quality application of the finish, and its drying, as well as rubbing; are all problems of considerable magnitude. The resident engineer should be experienced with the various processes involved—otherwise considerable time will be lost in familiarizing himself with the same.

(Continued in April Issue)

Can Furniture Sales Be Increased?

Other Industries are on the Aggressive, What is the Furniture Industry Going to do to Get a Fair Share of the Spending Money of Canadian People—Furniture is not Sold When Shipped to a Dealer, it is only Crowded in the Channel of Distribution — Public Demand the Final Outlet

By T. Lyle Blogg

In the brief history of the Home Furniture Bureau a number of valuable facts, which the furniture industry would do well to contemplate and act upon, have been revealed. Our initial advertising campaign, which ran during the fall of 1920, was heralded in both Canada and the United States as the most forward step that the furniture industry had taken in many years. Great things were predicted for the future of the industry if this sort of advertising was persisted in and other logical means of propaganda exploited as time went on.

The furniture trade of Canada welcomed as a substantial sales help and a bid for future co-operation, this great campaign. And after it had been in progress but a few weeks, letters from the leading furniture dealers of Canada arrived in every mail, congratulating us on our splendid vision and telling of the great interest that had been created with the buying public.

Furniture Dealers Won Over

Every encouragement was offered to the dealers to exploit the campaign locally in every way possible. The newspapers caught the spirit of the campaign itself, and succeeded in getting dealers to run extra quote a big dealer in one of our Western towns, "On advertising of their own, offering good furniture and furnishings—the necessary materials from which a better furnished home must be created. Dealers adopted for their own use the campaign slogan,—"Better Furnished Homes Mean Greater Happiness," and they dressed their windows frequently and in good taste. The result was that the very spirit of the campaign pervaded the community, and furniture became a topic of conversation in the homes, on the street and in the circles of society.

Resulting from this aroused interest more furniture was sold than had ever been sold before. To the day after your recent advertisement appeared we had several customers tell us that they had been influenced by this publicity, and we had a day's business considerably over the average." One Regina newspaper wrote us that during the first weeks of our campaign they carried more furniture advertising than they had for years, and they held the record for this district. This great increase they attributed to the impetus given furniture selling through our Better Furnished Home Campiagn.

Felt the Need of Assistance

After the advertising had been in progress some time, the dealers seemed to be awakened to the possi-

ble market that could be created for furniture, if only they would exploit it. Then this bureau received many requests from dealers for smart newspaper cuts, booklets on furniture and room arrangements to give to their customers, also practical information for their salesmen. They deplored the lack of original ideas for their window displays and asked the bureau if we could not help them. They also sought assistance with their copy, and expressed a wish for a service of interior decoration, so that they could offer their customers a complete service on the re-furnishing of an entire room or a whole house in all its details. In fact, we had the furniture dealers of Canada on their toes, straining at the leash to get after the business that only needed getting after to make sales.

We were able to satisfy but a few of their many requests, and assured them that we were just getting under way, and would later on expand into these many other activities and co-operate with them, in every way possible, to bring the furniture industry into its own—to make better furnished homes a topic of every day conversation, and good furniture "the thing."

This new interest of the dealer had its reflection in the newspapers of the country in which we were advertising, and requests began to come in for helpful, practical articles on furniture and furnishing, for inspirational articles on the history and romance of furniture and for good illustrations suitable for newspaper work, showing attractive rooms for the entire house and for houses of different sizes. Again we were obliged to procrastinate and promise material a little later, and expressing our pleasure at their willingness to co-operate.

One Thousand Requests Received

Business conditions changed, the slump hit us, but after a steep up-hill fight by the champions of the cause we succeeded in getting another Better Furnished Homes Campaign under way in September 1921.

This time we used twenty-six advertisements, each showing an attractive room, furnished with Canadian made furniture. These twenty-six room scenes were then published in booklet form and offered to the public through our advertisements at 10 cents a copy. The results of this step in a two months campaign was a thousand requests for this portfolio, each request accompanied by 10 cents. Practically every request was also accompanied by a letter, often short and to the point, but of the thousand letters received the majority of them indicated a thirst for knowledge on the subject of home furnishing and furniture. Many professed their ignorance and surprise to learn that such attractive furniture as was illustrated in our advertisements was being made in Canada. They wanted our portfolio, often enclosing 20 cents and the address of a friend to whom the portfolio was also to be sent in order that they too might learn of this new found Canadian product. One man, a Montreal lawyer, had just built a new house, and confessed that he had planned to buy all his furniture in the U. S. A. but having followed our series of illustrated advertisements, had decided to buy in Canada for this new home, and for all his future requirements of furniture. He didn't know that there was any real furniture made in Canada—and after all how should he know?

Some people sent in diagrams of their rooms and a list of furniture which they had, asking for a good arrangement. Many times the actual advertisement which prompted the inquiry was taken from the newspaper and enclosed with the letter, and it is interesting to know that we have received practically every advertisement in the series at one time or another. This shows that all classes of people were interested in our campaign, as some of the furniture we illustrated was of the simplest design.

The response from dealers from this second campaign was not as large as from the original one, but nevertheless many letters were received, most of them expressing the hope that the campaign would be continued as it was beginning to have a favorable effect on the sale of furniture.

Considering Future Activities

Our second campaign is over, and we are now considering ways and means for our future activities. The question comes up "Is the furniture industry to stand still and allow the retail tarde to create the market for the class of furniture that is most easily sold and gives the best profits, or is the industry going to be master of its own destiny, create its own market, and educate the people to honestly made, well designed, but not necessarily costly furniture.

The unbounded faith that many of us have in the future of the furniture industry is going to carry this great home movement on and on to its full success, and by so doing render a commercial service to ourselves, a benefit to our fellow-men and a patriotic duty to our country. For "no nation can rise above the level of its home life."

In the throbbing life of Canada no industry has greater potential possibilities than the furniture industry, for the subject of home furnishing is one in which everybody is interested or can be interested. It has been well said "a home, be it nest, cave, tent or house, is the goal of every living thing." That spirit is latent or alive in all of us, and it is the human instinct that the furniture industry can arouse interest, develop and educate in the next ten years and bring the industry to the thoughts of people and into the everyday conversation of the nation.

Just so Much Money to Spend

Considered nationally, the people of Canada have so much surplus money to spend after they have provided for their food, clothing and shelter. The problem before the furniture industry is to get a liberal share of that surplus money. Get it in the face of stiff competition, from the industries marketing automobiles, furs, diamonds, clothes, jewellery, electrical appliances and a score of other things that it is possible to do without. These other industries have forced their way to the front from well planned and persistent advertising and propaganda work carried on over a period of years.

We are inclined to think that furniture is sold when it is sent to a dealer. It is really only crowded into the channel of distribution, and the dealer who gets it must sell before he is in the market again. The intensive selling that we sometimes do is but to the dealer and is only blocking the channel of distribution. Public demand is the final outlet, and the furniture industry must develop that outlet into a steady all-year demand by educating the public to what is good taste in furniture and by impressing upon them the educational influence of proper environment on the character of the rising generation, and making up

to-date well made furniture as much to be desired as up-to-date clothing.

Co-operation All that is Needed

As a closing thought, we have every reason to be proud of the furniture industry of Canada considered internally. Our factories are well equipped, our furniture is attractively designed and honestly built. It is well finished and efficiently crated. The price asked is in harmony with the times and it is usually shipped promptly and then forgotten so far as the industry is concerned.

The furniture industry of Canada should resolve to get some of the fruits of advertising and propaganda work that have been obtained and are being enjoyed by such co-operative organizations as the Indiana Limestone Ass'n; California Raisin Ass'n; The Metal Lath Mfrs.; The Red Cedar Shingle Ass'n; The California Fruit Growers; The Birch Ass'n; The Walnut Growers Ass'n; The Associated Tile Mfrs.; The American Walnut Ass'n; The Gum Association; American Face Brick Ass'n; American Hollow Tile Ass'n; The Cypress Ass'n; The Arkansas Soft Pine Ass'n; The Prune & Apricot Growers Inc.; The Oak Flooring Mfrs.; The Wallpaper Mfrs.; The Common Brick Industry; The Mahogany Ass'n, and many others. Everything to build and finish a house—everything but furniture. Are we going after the business as an industry? BETTER FURNISHED HOMES MEAN GREATER HAPPINESS.

New Woodworking Organization

One of the newest additions to the woodworking plants of Toronto is that being constructed by the Meyers Lumber & Mfg. Co., Limited. This concern was recently organized with W. J. Meyers as president and W. Warren, managing-director. They have secured a six-acre site on the old Belt Line midway between Spadina Ave. and Bathurst St. Their plans call for a two-storey factory 68 by 80 feet, with separate office, storage sheds, stables, etc. A modern dry kiln will be put up. The lower floor will be equipped as a general planing mill and breaking-out department, while the upper floor will consist of a sash and door and woodworking plant. In passing it might be of interest to mention that trussed roof construction will be used doing away with all posts in the second storey. They intend to specialize in interior trim, flooring and table millwork of all kinds, as well as cater to the general lumber trade.

The equipment as planned is as follows:—swing cut-off; power feed rip; band resaw; double surfacer; chain mortiser; tenoner; sash and door sticker; hollow chisel mortiser and relisher; three-drum sander; drum and disc sander; belt sander; band saw; ball bearing shaper; boring machine; grinder; pony planer; variety saw; rip saw; cut-off saw. The drive will be electric. The equipment is to be arranged in groups and each group will be driven by a separate motor.

W. Warren, the managing-director, has had many years of experience in the retail lumber and general woodworking field. For many years he was with Cushing Bros. & Co., Limited, of Calgary, and more recently was manager of the West Toronto yard of the R. Laidlaw Lumber Co.

"Create consumer interest for the dealer, by working, for the interests of the consumer."

Toy Exhibition at Toronto

The toy fair held recently at the Queen's Hotel, Toronto, attracted hundreds of buyers from all parts of the Dominion. After a review of the articles on exhibit one can hardly help but be convinced that the Canadian toy industry has made great progress in the last decade, taking full advantage of suspended importing from Germany. However German toys are reappearing again in large quantities and are apparently able to undersell the Japanese manufacturers who have, in the past five years, exported large quantities of toys to Canada. Canadian toy makers of, especially the heavier lines such as wooden baby carriages, kiddie cars, wagons, cradles, automobiles, etc., are meeting with ever growing success, many original and attractive articles being displayed. Perhaps the most elaborate exhibit in the wood line at the Toronto toy exhibition was the display of two sets of enamelled nursery furniture by the Alliston Wood Products, Alliston, Ont. These pieces were made of basswood finished in blue and pink and were the object of favorable comment among the visiting buyers. Other attractive displays were the Earlscourt Toy Works, the Kiddie Kar exhibit, the Gendron carriage and wagon showing and the excellent work of the Vetcraft people in wood and metal.

The following figures for the eight months ending November 1921, give total value of toys imported from Japan and Germany:

	1920 (8 mos.)	1921 (8 mos.)
Other toys, Germany	$166,577	$59,529
Dolls from Japan	416	32,148
Dolls from Germany	248,921	110,039
Other toys, Japan	4,117	126,561

Fire Losses For 1921

The sum of $5.52 per capita is the amount of the fire loss chargeable to every man, woman and child in Canada for 1921, or a total of over $45,000,000.00. In spite of fire prevention propaganda carried out by various organizations, the losses from fire seem to be increasing from year to year. In 1919 the figure was, roughly, $25,000,000.00, 1920, $28,000,000.00 and in 1921 $45,000,000.00, an increase of approximately 60%.

A deplorable feature is that the greater part of this loss need not have occurred, for simple precautionary and preventative measures would have reduced the loss in many cases if they would not have prevented it altogether. When we consider that the per capita loss in Canada is the highest in the world and is nearly six times as great as the per capita loss of Great Britain, we are forced to the conclusion that Canadians are not as careful or as progressive in regard to fire and fire prevention as the citizens of other countries.

As the total fire loss of Canada climbs, so the proportion of the loss borne by the woodworking industry grows in proportion. From the viewpoint of fire, woodworking is a hazardous occupation as fire hazards exist on every hand. Such simple precautions as orderliness and cleanliness of plant and surroundings, coupled with fire-fighting and prevention equipment, will do much toward reducing the fire loss borne by those in the woodworking field.

"To stop advertising is to stop greeting old friends and to stop making new ones."

"Send Me Everything for My House"

Western Woodworking Organization Carries Complete Line of Building Supplies —Had Small Beginning in Tent 16 Years Ago—Present Plant Modern and Complete in Every Detail—Use Plan Book and Catalog to Create New Business

By E. H. Chapman, Winnipeg Editor

The present huge business of the Hayward Lumber Company Limited saw commencement in a tent at Vermilion, Alberta, in 1905, when G. E. Hayward, the president of the company, first laid the foundation of a business which following the advice of the late J. J. Hill "Came West and grew up with the country." After eight months under canvas a wooden structure was erected and the tent abandoned. Much

G. E. Hayward, Edmonton, Alta., President, Hayward Lumber Co. Limited

of the prosperity which the company enjoys is due to this factor; that the originators advanced with the settlement of the west, and were in a position to understand the demands of the people and supply them. At the present time this progressive organization is operating branches throughout alberta.

The parent plant at Edmonton is one of the most modern and best equipped factories of the kind in the west. This has not been accomplished without considerable effort and sacrifice. It has taken close application and persistent effort to reach the present standard, and possibly the principal to which can be attributed the rapid growth is the fact that the methods of doing business followed, have appealed to the buying public; their policy always being one of honesty and straight-forward dealing in the merchandising of their goods—has always in fact, been one of giving "Quality and Service" (the motto which they have now adopted as their slogan.) A business founded on these ethics is sure to succeed. Since the commencement of the Hayward history it has been their opinion that satisfying the people who needed homes and buildings was the main thing, and though dollars and cents were held in considerable regard the greatest consideration, was "Quality and Service," and it is on these principles that the Hayward business is conducted.

Found Larger Plant Necessary

In 1915, what is known as the old plant, was purchased from the official assignee of the Northern Lumber Company, which concern was in liquidation. Following this movement in the spring of 1916 the head office was moved from Vermilion to Edmonton, it being recognized that they would have more scope for extension and development in the capital City.

Due to tremendous increase of business in 1919 it was found that with the facilities at hand it was impossible to cope with the business, and a larger plant was decided upon. With this idea in view an entire block adjoining the old property was purchased and additional siding accommodation was arranged for with the railroad company. Early in May 1920 a fine new pressed brick building commenced to rear its head skywards. The main building is two storeys high, 162 feet by 66 feet all being of pressed brick with steel sash, wired glass and fire proof doors. The building is steam heated and all modern plumbing, while the fact that it is as nearly fire proof as practicable, makes a large saving in the way of insurance premiums.

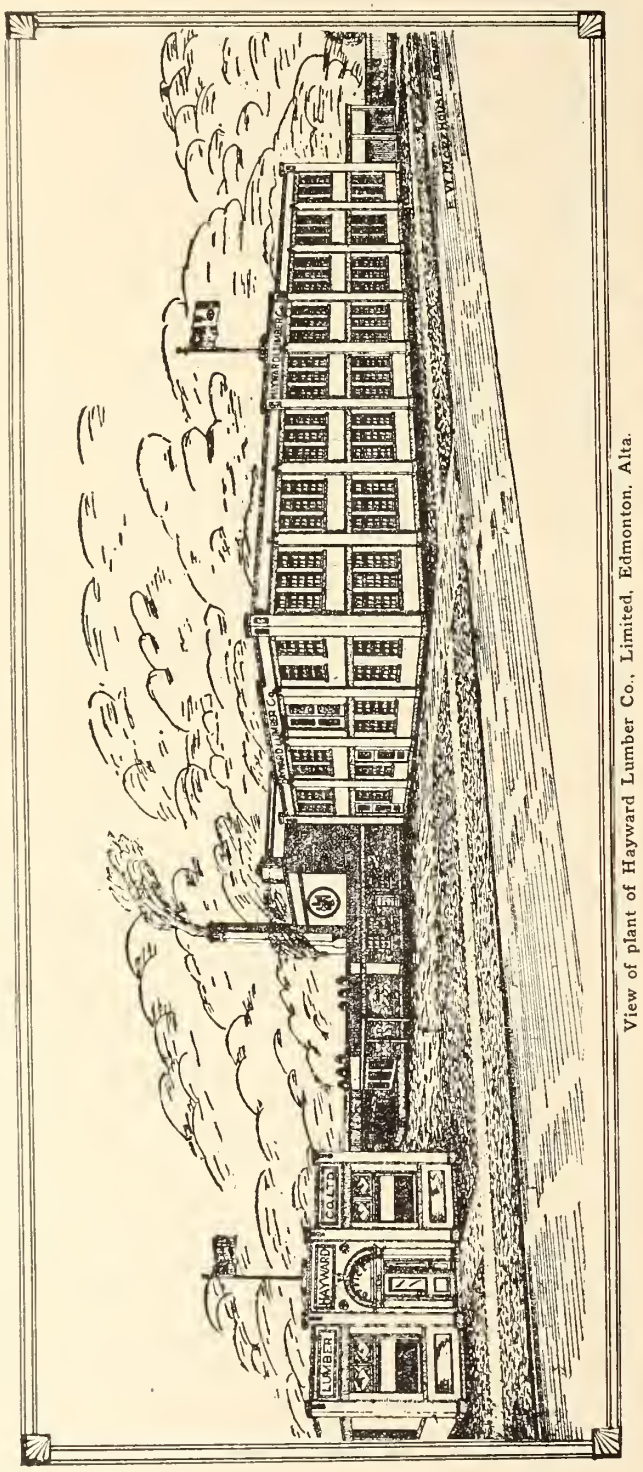
New Plant Thoroughly Modern

At the present time the factory is busy; the planers, sanders, rip-saws, and other wood-working machinery filling the air with their song of industry. the equipment is most modern; all the drive is overhead which makes for convenience, and safety for the workers, and the entire plant is operated by electricity, individual motors supplying energy for each machiine. A suction system is connected with each unit. This is operated by a 60 horse-power motor, and is effective in keeping the machines and the building clear of sawdust and shavings, which are later elevated to the top of the building, the air extracted, and the material fed to the boilers which supply the necessary heat for the drying kilns. A noteworthy feature of the factory is that it is flooded with light from windows in all directions, which makes for better working conditions and the turning out of quality goods.

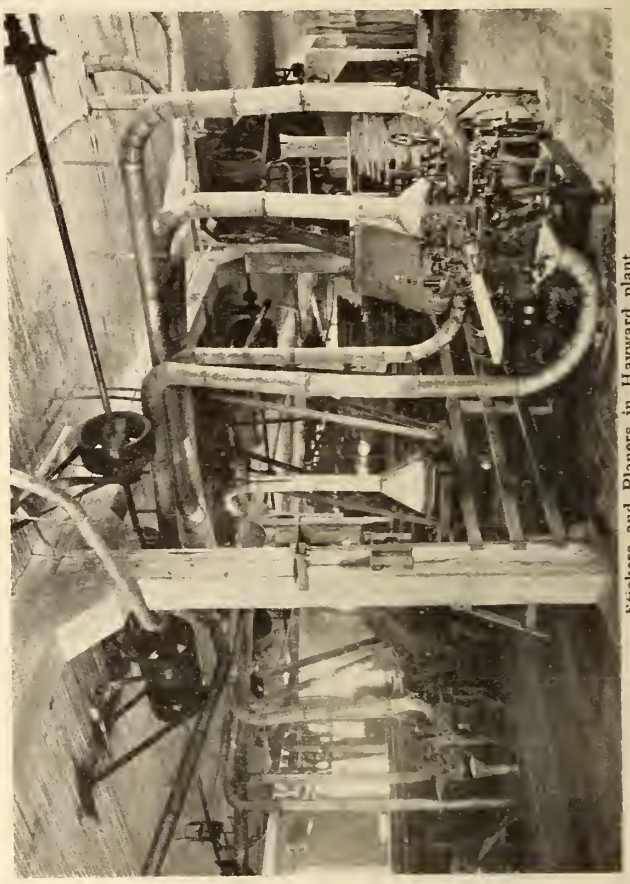
A complete saw filing and machine room in maintained where all necessary repairs and alterations are made for the numerous machines, and in addition to the floors devoted to the many varieties of wood goods which the Hayward Lumber Company turns out, there are separate departments for glazing, glueing, and erecting, as well as glass and packing rooms.

Sash, doors, and all interior finish is being turned out in large quantities, not only for the Company's branch yards, but these goods are being delivered throughout all the Northern portion of the province.

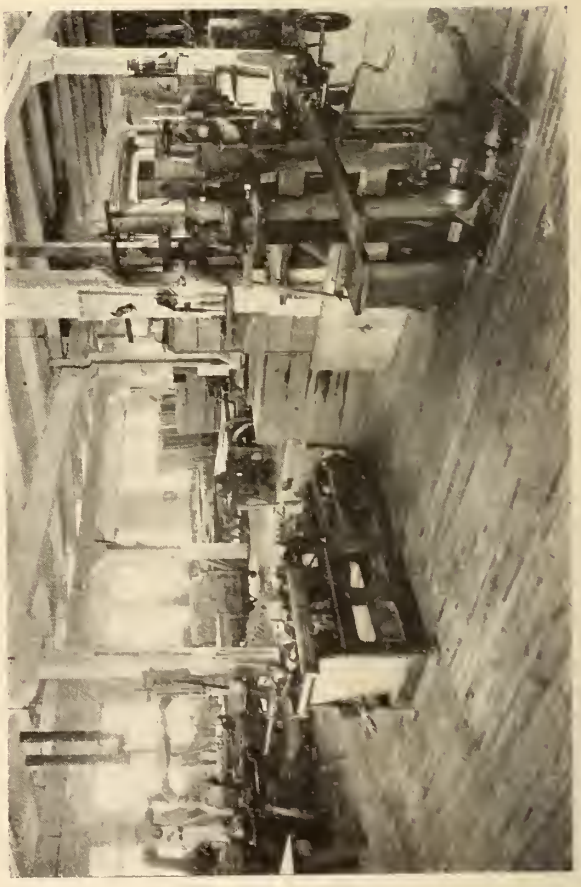
The plant is equipped for making all classes of mill work, store fixtures, office equipment, including



View of plant of Hayward Lumber Co., Limited, Edmonton, Alta.



Stickers and Planers in Hayward plant



Scene in sash and door department

special house and office cabinets, etc. Builders' supplies are also handled, and every requisite for a building can be obtained from the Hayward Co., from the interior finish to the paint for the exterior finish. All that is necessary is to say "Send me everything for a house of such and such a plan, or for a fixture of such and such a design," and the Hayward Lumber Company will do the rest.

Lunch Room For Employees

The saws, framing machines, planers, stickers, boring machines, lathes and re-saws occupy most of the main floor, the machines being footed in concrete. On this floor there is also a lunch room for the accommodation of the employees. On the second floor, which is especially constructed for strength, with laminated flooring, are saws, shapers, tenoners, stickers, panel raisers, band saws, clamps, triple-drum sanders, planers, rip-saws, trimming saws and jointers. There are specially fitted benches on this floor flooded with light so that the most intricate fitting can be accomplished under natural conditions. An electric elevator maintains service between the two floors, this being of sufficient capacity to handle loads of lumber in full lengths.

The power house is constructed of solid brick and concrete, fitted with a fireproof shavings vault 16 feet wide by 30 feet long, with a depth of 26 feet. By the utilization of the shavings for fuel the company is enabled to operate the large drying kiln at a low cost, this latter being the most modern of the kind west of Winnipeg. This is known as the Grand Rapids Dry Kiln and by its use the firm is able to guarantee any special work to be free from shrinkage, checking, etc., and enables them to turn out show cases, store fixtures,etc., which are the equal of and imported from Eastern Manufacturers.

The old factory buildings are being used at present for storage and warehouse purposes, and although totally eclipsed by the new brick structure, they are, nevertheless, equally as good as the ordinary run of lumber constructed factories, and have a large capacity for storage purposes, where the lumber is kept out of the weather and is ready for immediate use.

Have Catalogue and Plan Book

In addition to the city business and trade radiating from the local yards of the company, the wholesale business has been greatly extended, due, in great measure, to the modern manufacturing plant which they now operate. Orders are now being shipped to British Columbia on the West; as far east as the Saskatchewan border; south to Calgary; and as far north as habitation extends. The company have not only a catalogue, but also a series of illustrated plan books outlining designs for dwellings and farm buildings. The houses shown are specially suitable for the West, and the lumber, interior finish, nails, locks, paint and every requisite for the building is furnished by the Hayward Company complete. In addition to city and farm homes the Hayward Company, recognizing what the future of the dairy industry means to Northern Alberta, are also handling a new form of silo, which will insure soft feed for the milk producers the year round. This silo is specially designed to meet the requirements of the Northern climate, and the company is looking forward to supplying many farmers with these valuable revenue producers.

The general condition in the rural districts is much more satisfactory at the present time, says Mr. Hayward, than what he anticipated a month or so ago, while conditions are looking very favorable for the year 1922. Prices of lumber, have reached normal level, and big things in the way of improved farm and city homes are looked for in the near future.

G. E. Hayward is president and general manager of the company, and John Henning is Secretary-Treasurer.

How Low Does Your Competitor Figure?

One Woodworker Thinks He can Make Thirteen Sash and Frame for $84.00—How Does this Compare with Your Figures?—Possibility of Error in Calculating and Applying Waste—Cost Estimates Vary 80 per cent

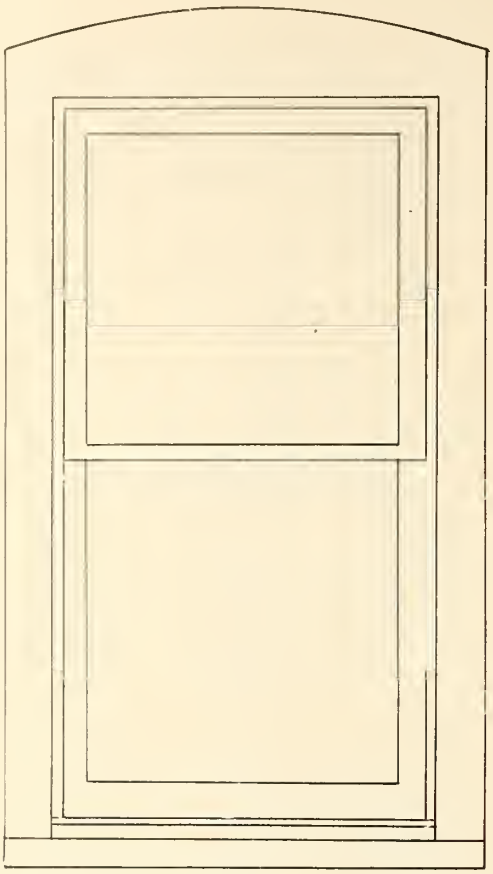
The article dealing with sash and frame costs was practically crowded out of the February "Canadian Woodworker" on account of the special nature of that issue. Judging from the letters received from readers, these articles are arousing a considerable amount of interest in woodworking costs, and as a result are bound to have a beneficial effect. As many have requested that other articles be published these cost studies will be continued in the next few numbers.

While the response provoked by the articles which have appeared has been highly gratifying, the amount of co-operation which has been forthcoming, has been disappointing. Even among those who have written in expressing their interest and appreciation and asking for information with regard to various phases of the figures published, there has been a marked disinclination to co-operate and submit cost figures. This should not be so. The curse of the woodworking industry is the blind, ignorant competition so often encountered, and any movement tending to ameliorate this condition should have the hearty, active support of every progressive woodworker. It may take a little time to figure out and submit a cost estimate but, in doing so, one has the satisfaction of having done something to improve conditions in one's chosen industry and to improve the competition with which one is confronted.

Different Ways of Figuring Material

The subject this month is 13 frames and sash, as shown in the accompanying sketch. This study is a little more complicated than those which have been covered. For this reason it is not possible to compare some of the details as on other occasions. Take the question of material. Some figured the whole job on a feetage basis while others figured certain parts as so many feet and the remainder on a lineal feet basis. That being the case, there is no common ground for comparison purposes. Some woodworkers run quantities of standard pulley stile stock, casings, parting strips, etc., and charge such material

against each job at a price per lineal foot, which covers overhead and wastage.



Box frames and sash—13,—3′ 6″ x 6′, 1¾″ 2 light sash, brick opening, cambor head

Cost Estimates Submitted

Estimate	Waste	Bench	Machine	Total
1	15	10	13	$ 84.40
2	10	12	16	87.32
3	10	17	10	92.30
4	20	22	18	98.20
5	17	18	16	107.76
6	10	26	52	118.17
7	20	30	20	119.76
8	**25**	**35**	**20**	**128.47**
9	30	40	24	133.10
10	10	26	32	138.65
11	15	18	40	151.80

Coming to the proper percentage of waste, the same old lack of uniformity is found. Of the 11 sets of figures submitted, four include waste at 10%, two at 15%, one at 17%, two at 20%, one at 25%, and one at 30%.. There is not the slightest doubt that 10% is too low. It is doubtful if there is any class of woodwork which can be made on such a small wastage basis. Box manufacturers are not hampered by such exactng restrictions as to quality of stock as is the millwork manufacturer, yet the average waste allowance in the box field is in the neighborhood of 17%. Judging from this fact alone, it is doubtful if any allowance under 20% will cover the waste on sash and frames. Again, experience has convinced certain woodworkers who keep close check on all materials coming into their plants, that this class of work should carry 20 or 25% waste.

How Waste is Calculated

Nothing is gained by making the waste allowance too low, that is, lower than warranted by the actual amount of lumber required. If the manufacturer figures 10% waste when it actually amounts to 20%, he is just kidding himself to the amount of 10% of his material costs, and his profit is just reduced by that amount.

There may be some difference in the way certain woodworkers figure waste. One reader wrote in, asking if all material is figured at actual cost with the waste added. The usual practice is to take the actual net feetage of material required to complete the job and then add sufficient allowance to cover the waste; for instance it takes 1,000 feet to cut the material for a job having a net feetage of 800 feet. It is evident then that the waste must be 200 feet. Now the way this is figured and applied makes a considerable difference in the waste allowance. On 1,000 feet a 200-foot waste is 1/5 or 20%. Figuring the other way—20% on 800 is 160 feet, giving a total of 960 feet and leaving 40 feet for which no charge or allowance is made. The correct way to calculate is 200 feet waste on 800 feet net requirement, or 25% on the net feetage. This gives the correct allowance.

To make a study of the time submitted is really amusing. One thinks ten hours should cover bench work while another guesses 40 hours is about right, or, again one lets the machine work go at ten hours while someone else maintains that 52 hours is required. In some cases the bench time figured exceeds the machine time allowed while in others the reverse holds true. Totalling bench and machine hours together, they read 23, 27, 28, 40, 48, 50, 55, 58, 64 and 78, a difference between high and low of 55 or nearly 300%. Comment here is unnecessary.

Who Makes or Loses?

The prices speak for themselves,—from $84.40 to $151.80, or nearly 100% variation. The difference in equipment, organization and methods found in various plants would preclude the probability of any two figures being identical, but such differences would not account for a variation of $67.40 on a job of this size. Either $84.40 is far too low or $151.80 is away high. Sash and frames might be termed an everyday commodity. Is the plant which works on an estimated cost basis of $84, $87 or $92, losing money on every order accepted for sash and frames?

This order called for 13 box frames, brick opening, 3′ 6″ x 6′ 1¾ inches, two light sash, 7/8 inches pulley, pulley stiles, 7/8 inch inside and outside casings, 1 3/8 inches hanging stiles, 2 x 6 sills, and cam-

Are the Figures Correct?

If you detect any errors or omissions in the detailed costs included in this article, do not hesitate to bring such inaccuracies to our attention. Numerous ideas and suggestions would be brought out if those who read this cost material were to send in constructive criticisms of the figures submitted. Let us hear from you.

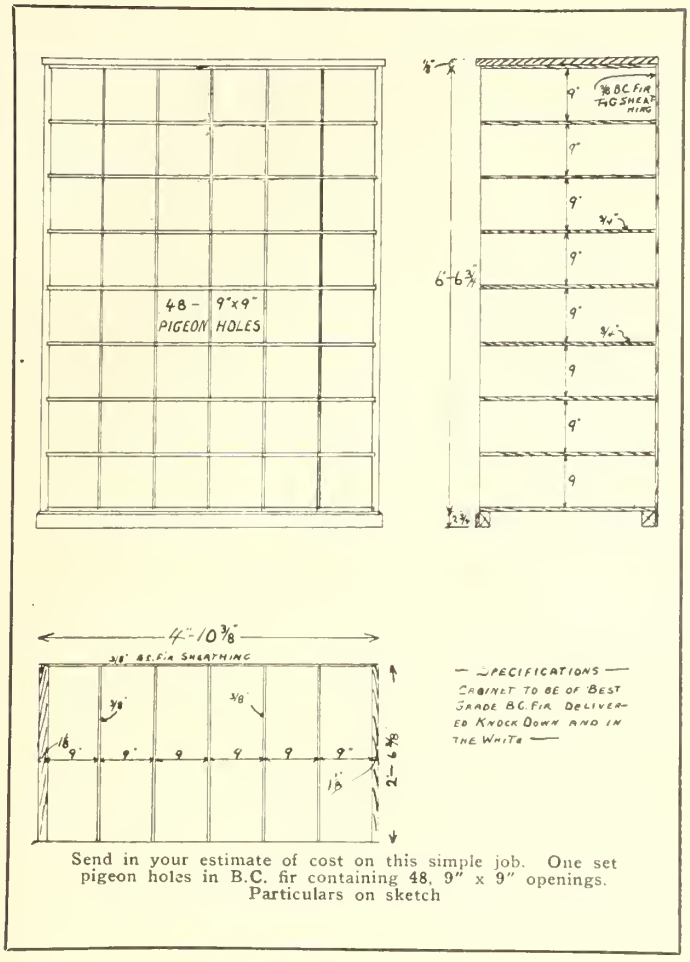
bor heads. The cost submitted by the firm filling the order, shown in black in the list is $128.47, and is made up as follows: in the second cost shown all the material is figured on a feetage basis:

Details of Original Cost

Material				
185 ft. sash pine	@	$ 75.	$13.85	
53 ft. Dsg. pine	@	100.	5.30	
			19.15	
Add 25% waste			4.79	
				$23.94
151 ft. Lin. 5 inch pulley stile	@	3 cts.	4.53	
49 ft. Lin. 2 x 6 Jamb pine	@	6 cts.	2.94	
195 ft. Lin. Parting strip	@	1 cts.	1.95	
206 ft. Lin. 4 inch casing	@	2 cts.	4.10	
206 ft. Lin. 3¼ inch casing	@	2 cts.	4.15	
208 ft. Lin. 2 inch Hang. stiles	@	1½ cts.	3.12	
154 ft. Lin. Backing	@	3 cts.	4.62	
				$49.36
Labor				
Machine	19.40 hours	@ $1.20	$23.60	
Bench	34. hours	@ .90	30.60	
Helper	1.30 hours	@ .60	.90	55.10
52 axel pulleys	@ 5 cts.			2.60
				$107.06
Add 20% overhead				21.41
				128.47

Cost Details Submitted by a Reader

Material in Frame			
152 lin. ft. Pulley Stile 7/8 x 4¾	— 63-4		
50 lin. ft. Head 1-3/8 x 5-1/8	— 31-10		
50 lin. ft Sill 1-3/4 x 5-3/4	— 50-0		
193 lin. ft. Parting stop 1/2 x 7/8	— 10-1		
193 lin. ft. Sash Stop 1/2 x 7/8	— 10-0		
51 lin. ft, Facing 7/8 x 3	— 12-9		
310 lin. ft. Facing 7/8 x 3¾	— 103-4		
47 lin. ft. Cambor 1-3/8 x 4½	— 29-6		
202 lin. ft. Brick Stop 1-3/8 x 1-3/8	— 38-6		
	340-10	@ 78.00	$27.21
156 lin. ft. Black 3/8 x 5¾ x 39-0		@ 55.00	2.15
			29.36
20% Waste			5.88
			$35.24
52 Pulleys			3.38
Nails			1.04
Material for sash			
156 lin. ft. Stiles 1-3/4 x 2¼	60-0		
43 lin. ft. Top Rail 1-3/4 x 2¼	17-1		
43 lin. ft Bot. Rail 1-3/4 x 3¾	28-4		
86 lin. ft. Meeting 2¼ x 1½	24-3		
	129-8	@ 78.00	10.12
10% Waste	-		1.52 11.64
Sash pins			.10
Machine Time Including Helpers 16 Hrs.		@ 1.50	24.00
Bench Time 18 Hours @ .80			14.40
			89.80
20% Commercial Burden			17.96
Total			$107.76


48 - 9"x9" PIGEON HOLES
6'-6¾"
4'-10⅜"
⅜" B.C.FIR SHEATHING
— SPECIFICATIONS —
CABINET TO BE OF BEST GRADE B.C. FIR DELIVERED KNOCK DOWN AND IN THE WHITE

Send in your estimate of cost on this simple job. One set pigeon holes in B.C. fir containing 48, 9" x 9" openings. Particulars on sketch

The cost study for April is a simple little job that is often encountered in the days' work—a set of pigeon holes containing 48 9" x 9" openings. The specifications as shown on the accompanying sketch call for B. C. fir, 3/8 inch fir sheeting for back, ends 1 1/8 inch, vertical divisions 3/8 inch and horizontal shelves 3/4 inch to be delivered in the white. Would it not be interesting if the April issue of the "Canadian Woodworker" were to contain 25 cost estimates each giving material, waste bench and machine time, and commercial burden? It depends to a large extent on you. Send an estimate in without waiting to be asked. It will be appreciated.

The slides of outside moulders should be cleaned and kept in a bright condition, so it is not too stiff, otherwise it is possible to strip the thread of the screw which adjusts the table.

If you have a lathe which is not working it is possible with a little ingenuity to make it do a great deal of useful work. A small emery wheel could be attached or a sanding wheel.

With some very cross-grain wood it will save a good deal of stock if the cutters are carefully fitted, and an operator who can recognise at a glance which way the grain of the wood lies.

Many a man has failed at saw doctoring because he has trusted to his hands instead of his brains. What is needed is, the technical knowledge about saws, skill, and plenty of common sense.

Can You Kiln Dry Oak in Seven Days

Speed of Drying Operations Important Factor but Drying Losses Must be Held Down at Same Time—Some Suggested Drying Schedules—How Maximum Results May be Secured

By P. E. POOLE

What are Your Drying Troubles?

The "Canadian Woodworker" would welcome an opportunity to assist you with your drying problems. In addition to being in touch with numerous dry kiln engineers, it is possible that some other reader of this paper has experienced and overcome the same troubles that are proving so annoying in your case. An outline of his experience might prove helpful. Just give a detailed outline of what you are up against, kind of trouble, species of wood, drying period, and temperature and humidity carried and if we can help you we will gladly do so.

Two phases of dry kiln work which should receive first consideration are drying lumber with a minimum drying loss from checking, warping, honeycombing, case-hardening,etc., and drying it quickly. Of the two it is not easy to decide which is the more important. While admitting the necessity for reducing drying losses to a negligible amount, yet the question of time must always be considered, as it is a determining factor in judging the efficiency of the drying operation. When the drying time is reduced to a very low basis and the drying losses held down at the same time as is the case with modern drying equipment intelligently operated, then and only then should one be satisfied with his drying equipment and its operation.

All too many woodworkers are experiencing considerable trouble from warping, checking and case-hardening, yet at the same time their drying periods are far longer than they need be, increasing the cost of the drying operation. Some few realize that their kiln-drying equipment or methods, perhaps both, are not giving the results they should, but others have not awakened to the realization of this fact and take their drying losses, high drying costs and vexatious delays as a matter of course.

What May Be Expected

Too much emphasis cannot be laid on the fact that it is possible and practicable to dry lumber in a kiln without any appreciable losses occurring from degrade or drying troubles. The proof of this is that many are doing it. One manufacturer writes,—"We are having absolutely no checking, warping or case-hardening, and the manufactured product is going through our finishing department under high temperature, (Probably meaning the varnish drying kilns.—The Editor.) with absolutely no warping. In addition we are convinced that other plants are not drying their stock any quicker than we are." It may and does require good equipment and intelligent operation, but satisfactory results can hardly be expected in any phase of manufacturing unless the equipment and methods are suitable.

Mention has been made of short drying periods. Are you able to dry 4/4 oak in six days? If others are doing this, is there any reason why you should not? If so, is it your equipment or the methods you employ, which are at fault? One manufacturer of dry kiln equipment is willing to give a written guarantee that his kiln, if operated in accordance with his instructions, will dry oak that has been on sticks for four months, in from six to eight days without warping, checking or case-hardening. This same time guarantee applies to walnut, birch, gum, chestnut and other hardwoods. Another manufacturer of dry kilns has found that fair average drying times for certain hardwoods are as follows:—oak 10 days, birch 9 days, gum 10 days, walnut 10 days, chestnut 10 days, poplar 7 days and maple 9 days.

Many Governing Factors

These are only average drying times, for there are so many variable factors, such as moisture content when entering the kiln, texture of wood, methods of operation, conditions in the kiln, the kiln itself, that it is impossible to give definite drying times. One set of drying schedules, which came to my attention recently, gave the following as fair average standards of performance:—hardwoods containing 15% moisture content, 7 days; with 15 to 20%, 8 days; 20 to 30%, 10 days; 30 to 40%, 15 days and 40 to 50%, 20 days. As stated above, owing to the many factors which enter into the drying operation, these times merely serve the purpose of giving an idea of what others are doing.

The Forest Products Laboratory at Madison, Wis., has issued drying schedules which are certainly on the safe side, that is, they have sacrificed time to secure safety. In actual practice their drying times can and are being reduced without any appreciable deteriorating effect on the stock. It might be of interest to include some of the figures, issued by the Laboratory, not because they may be taken as standards, but rather because they may be used as a maximum guide, that is, unless you can reduce the drying periods as given by Madison and at the same time dry your lumber without any loss from checking, etc., your kiln and your methods should receive some attention. Instead of showing the full schedules, drying times are given in days for stocks containing 30% and 40% moisture content.

Wood	30% Moisture Content	40% Moisture Content
Birch	10 days	12 days
Maple	11 days	15 days
Gum	12 days	14 days
Walnut	15 days	19 days
Mahogany	10 days	12 days
Oak	20 days	24 days

Designed for Certain Speeds

It would have been a satisfaction to have been able to have included a table of average drying times for various woods containing different quantities of

moisture. Such figures, however, are not available. The figures that have been included are given more to outline what can be accomplished than to seek to establish any uniform set of drying periods. There is one point which should be borne in mind and that is, that it is not practical to increase the drying speed of certain of the older type kilns, without making radical changes in the construction of the kilns themselves. This is given more as a warning, for if a kiln has not been drying oak, for instance, in less than twenty days the stock might suffer were an attempt made to force the drying. Dry kilns, like other forms of woodworking equipment, are built to work at a certain speed under certain conditions. The speed of modern drying equipment is much higher than that of older type kilns. Modern type dry kilns, intelligently operated, will give you minimum drying periods with very low drying losses.

Are You Looking to British Market?

Some Requirements Which are in Strong Demand—Vast Market if Prices are Right—Worthwhile Connections When Once Made

By Acting Trade Commissioner A. B. Muddiman, Bristol, Eng.

More than once this office has endeavored to call the attention of Canadian manufacturers of woodenware to the great demand there is in this country for dowels, handles, and every kind of manufacture of wood if of suitable pattern and quality. It is all a question of competitive selling price. If Canadian manufacturers can deliver at a price that competes, there is a vast market for their goods. In view therefore of the present prices, and also to discover how deep a post-war penetration into this field has been made by German and Scandinavian firms, a survey of local conditions has been made for the Bristol area. Once more this office must say that Canada with her enormous stocks of timber should be selling much more than she does.

Clothes Pegs

Trade inquiries have been received for clothes pegs. There are signs of German activity in this business here. One large importer states "the present German quotations for these pegs is 5s. per 5-gross box delivered. It is thought that this price will be down to 4s. 6d. next week. Quotations have been received from United States houses of 5s. 6d. per 5-gross box, but this price is too high." There is an enormous consumption of clothes pegs in Great Britain, and the only difficulty in placing consignments is gauging the market price at the time of sale. Both ordinary and spring-clip pegs are used. For the ordinary the size is 4½ inches, packed 5 gross in wooden case weighing under 2 cwt. Spring clips are generally packed in cartons of one gross. Quite recently a commission house had inquiries for a dozen carlots of pegs, and would have sold Canadian if the price had not been too high.

Dowels

Canadian manufacturers are covering the market fairly well, but might do more business if they watch German competition, or they may find themselves undersold. For though it is well recognized here that the Canadian dowel is of better quality than the German, their undercutting in price may make serious inroads on sales.

Drawing and Black Boards

There are not enough drawing and black boards at the present time, according to a large educational supplies house, to supply the demand. Germany, via Switzerland, is invading the market, but Canadian-made boards would be of much higher quality than the rubbish Germany is sending out to-day, and our firms need fear no competition with German goods in this regard, if they are prepared to go after the business. There are three types: triple (three-ply), clamped, and panelled. At the present moment for the most ordinary sizes the following are the prevailing wholesale prices. 16 by 11½ inches, 24s.; 19 by 13½ inches, 39s.; 22 inches by 17 inches, 43s. 6d.; 23 inches by 16 inches, 43s. 6 d.; 28 inches by 19 inches, 59s.; 31 inches by 23 inches, 87s.

Library Tables

The retail price to-day for library tables is about £7, and there is no doubt but that, if Canadian manufacturers can compete at this price, they have the goods and also a splendid opening.

Kitchen Cabinets

Kitchen cabinets are selling to-day at abnormally high prices, but even these are less than those of last year, when cabinets were going at £27 apiece. Canadian kitchen cabinets are very highly appreciated. They beat local goods in ingenuity, appearance, and general usefulness. It should be noted, however, that the sifter in the flour bin is not required here and the bin itself is on the large size for an English household. Eliminating the sifter and reducing the bin's size, according to an English woman, and adding a shelf, would make them perfect.

To-day if manufacturers can land Canadian cabinets in Great Britain at a price that it would make it possible for the retailer to buy them at £15, they would find a large sale. The cabinets in question should be k.d. and of small grain oak.

Students' Bookcases

Small open wood bookcases known here as students' bookcases, are in brisk demand to-day. Canadian manufacturers' c.i.f. prices for these to-day should be from 12s. 6d. to 23s. if they intend to land these goods. They should be shipped k.d.

A type of solid oak students' bookcase, 4 feet high and 2 feet wide, has been selling at 35s., an oak shortboy at 23s. 6d., and tallboys at 55s. and 63s.

Folding Tables

Tables suitable for out or indoor use, which will fold away in a small compass, standing 27 inches high, have a good market. Some are adaptable tables and made up into a kneeling desk, work table, tea table for the garden, music stand, etc. To prevent the leaves collapsing, bolts are fitted on the underside. The three usual straight and top sides are 22½ inches by 18 inches, 22½ inches by 22½ inches, and 22½ inches by 30 inches, while round tops with a 2-foot 6 inch diameter and also ovals are sold. They are made of deal, birch, oak, etc. An average c.i.f. price of 10s.

6d. apiece would find them a ready market in Great Britain to-day.

Deck and Seaside Chairs

The present retail price is about 7s. 6d. If sent over here k.d. and crated at a price around 5s. apiece, there is a good demand. Further, any firm desirous of turning out the ordinary deck chairs for the British pleasure steamer that haunts these coasts in summer would do well to communicate with this office with prices. The marketing for these last class of chairs is around January, and firms are too late for this year.

Handles for Coal Miners

The collieries in South Wales offer a fertile field for selling handles for hammers and picks if the price is right. Any one entering this line must be prepared to land these at the colliery before payment. There is no risk in this with the great Welsh collieries, only all goods will be searchingly examined to see that they are up to sample. Special sizes prevail and there are many patterns. At the present moment this office is in a position to procure a complete set of sample patterns and sizes at a small figure for firms interested.

Tubs

Lard and caramel tubs offer another opening on a large scale if the quotation is low. They are sold by the dozen. Washtubs with diameters of from 22 to 26 inches are used. They should be shipped nested.

Washboards

In regard to washboards it is well recognized here that the Canadian washboard is of the best quality. Factories should send their agents a small stock to keep on hand and prices must not be jumped about, as some Canadian manufacturers have been doing when large orders are forwarded. The object of the small stock for the agents is to keep clients supplied until the arrival of the direct order.

Miscellaneous Requirements

There are many other miscellaneous requirements which could be supplied from Canada, such as broom handles, towel rollers, rolling pins, wood mats, wood measures, wooden screw taps, three-ply veneer chair seats, oblong and round, ironing boards, etc. In some lines, however, United States, Swedish and German manufacturers have a hold on the trade, such as in coat and dress hangers. Prior to the war Germany had a flourishing trade in bread boards, while knife boxes came from Austria and Germany, and some were made in England. The most popular water-closet seat is a ring seat with a cover, made of hardwood, in two states, polished and unpolished. Another line in this direction is an extension seat with a cover. This is of hardwood in two states, polished and unpolished. The writer is informed by a commission house here that there is a good demand for such seats. Again fish tail handles for varnish brushes of white wood in ½-inch from 1-inch to 4-inch could be catered for.

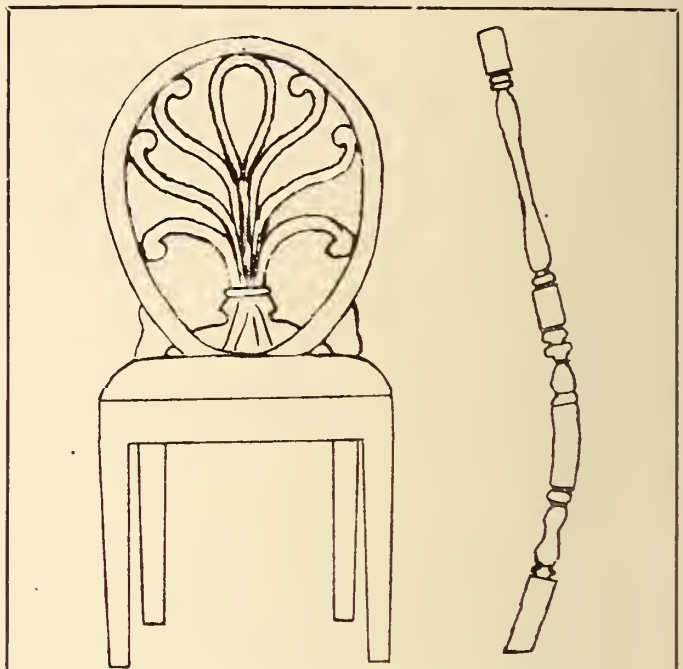
Also in mops and handles for mops, a good business is open if the price is right. It is essential for manufacturers who are desirous of entering the trade, to send their prices.

The bulk of wooden manufactures in this country are imported by commission and merchant houses. Users prefer to purchase supplies from them rather than import direct from overseas. Consequently the trade is largely a question of a comparatively modest rate of profit upon a very large turnover. Mass production therefore for export purposes is essential for Canadian houses to compete with United States and Scandinavian houses.

A consignment method of marketing is one of slow penetration and needs a fair margin of capital. But it must be remembered that once this British market with its huge demands is definitely entered it is one that may be readily maintained.

How Would You Make This Chair Back?

A subscriber of the "Canadian Woodworker" has written asking for details and method of constructing the back of the Hepplewhite chair shown in the accompanying sketch. He also wants information as to the best method for turning the bent, back chair



Send in your method of constructing this chair back and your idea of how the curved back post should be turned

post, shown beside the chair. We are publishing this in the hope that some readers, who are well acquainted with the problems involved, will send in information which will be of service to the party making the inquiry. Your suggestions will be appreciated.

Management in Woodworking Plants

"Installing Management in Woodworking Plants" is the title of an instruction book recently published by the Engineering Magazine Co., New York, Carle M. Bigelow, author. This work treats of the unsatisfactory conditions existing in many woodworking plants and suggests how the work may be systematized and efficiency methods introduced. The subject is covered in a thorough and comprehensive manner, as will be gathered from the following chapter headings: Peculiarities of Woodworking; Making Scientific Management Essential; Organization and Its Installation; Product; Lumber; Purchasing and Storing; Planning Department; Layout and Routing; Shop Practice; Cutting of Lumber; Labor Control; Tool and Fixture Control; Repair Control; Waste Control; Power Plant and lastly Cost Accounting. The book is freely ilustrated with forms, charts, time studies, etc., and contains much that is helpful to factory managers and executives. Copies may be secured from the publisher or from the Woodworker Publishing Co., Limited, 345 Adelaide St. W., Toronto. Price $5.00

Imports of Cooperage Stock

The December Canadian Woodworker and Furniture Manufacturer contained an item referring to the imports of cooperage stock for 1919. The figures published, which gave the imports of staves as 26, 841, 432, were taken from a report issued by the Bureau of Census at Washington. W. A. Fraser, managing director of the Trenton Cooperage Mills, Limited, Trenton, Ont., takes exception to these figures and his contention is sustained by a report issued by the Bureau of Statistics, Ottawa, which gives the imports of staves for the fiscal year ending March 31, 1921 as 6,369,000 oak staves and other staves to the value of $233,444 which at the prices prevailing during that period would mean roughly 9 to 10 million staves or total imports of about 15,000,000 staves.

Mr. Fraser gives an interesting outline of why American cooperage stock is such a factor in the Canadian market. His letter is as follows:

"We notice on page 73 of the December "Canadian Woodworker" an item in connection with the importation of U. S. staves by Canada. There is certainly something wrong with the Department of Commerce Bureau of Census' figures, which give 26,841,432 staves as consumed by Canadian importers.

"While of course, owing to the fact that we have no suitable timber in this country for the manufacture of oak barrel staves, these are all brought in from the United States; but at the same time, taking both the tight and slack staves, nothing like 26,841,432 staves were imported during 1919. We would say that one-third of this figure would be the maximum.

"Having a further bearing on this matter, the four largest cooperage manufacturers in Canada only handled a total of 16,803,359 during 1919, and this total not only includes all staves of their own manufacture, but all U. S. staves brought in by them. As the bulk of the importing is done by the Canadian operators referred to, it will readily be seen that there must be something wrong with the U. S. Department's figures.

"Referring to the last sentence of this item, we would explain that the reason for the influx of American cooperage stock depends on three conditions that work directly against Canadian cooperage manufacturers.

"Firstly: While cooperage timber in Canada is limited, growing only in pockets, necessitating heavy rail hauls to the manufacturing centres, incidently at much higher freight rates than prevail in the South, the U. S. manufacturers have almost unlimited supply of cooperage timber available on water hauls throughout the bottom lands of the Mississippi, in some cases, producing as high as fifty thousand feet to the acre.

"Secondly: Practically all the labor employed in the American mills consists of low-priced, colored workmen, and in no branch of their operations do they have the severe Canadian climate to contend with.

"Thirdly: The rich bottom lands from which the cooperage timber is cut in the South, is worth more money with the timber off, for the production of cotton and sugar cane, than it is at the time the millmen purchase it, with the timber standing.

"Besides these natural conditions, the Southern cooperage manufacturer can operate his plant the year round, while in Canada we are confined to an eight month operation, as a maximum. This of course cuts down overhead with them.

"Another point that has often occurred to us and that we have, on several occasions, had up with the Traffic Department of the Canadian Railways is, that the arbitrary tariff arrangements our Canadian roads make with the U. S. transportation companies, when striking through rates, act directly in favor of the Southern manufacturer. As an example, we have from Georgiania, Ala., to Montreal, a distance of over fifteen hundred miles, a rate of 54½ cents on cooperage stock; while we are paying from Trenton to Montreal, a distance of 238 miles, a rate of 21 cents per one hundred pounds. The difference, as shown by this example, is borne out in all freight rates from points in the Southern States to the Canadian consuming centres."

A glimpse of Vancouver, showing plant of Pacific Box Co., Limited

Good Work From Box Board Printer

Features Which Should Receive Special Attention—Cold Weather Adds to Troubles Experienced—How Satisfactory Results May be Obtained

In its moods and tenses, the printing press is in a class by itself. No other machine in a box plant is so largely sympathetic with weather conditions for the production of good work as the printing press, say a writer in "Packages." It is a fair weather machine, needing plenty of sunshine and warmth.

The ideal location for the press is a room or enclosure, used for printing purposes only. This room should be sufficiently large to accommodate the press and its accompanying equipment, two floor trucks, and a bench for bundling. Enough windows to give plenty of good light are essential, a large door for the passage of trucks, and a smaller one for general use. The great difficulty in printing in cold weather is that the ink becomes so cold it refuses to ruu from the fountains and to spread. To conquer this difficulty is the chief reason for separately housing the press. The room should be provided with radiators and the air kept at a moderate temperature throughout the cold weather. The room should also contain cabinets or closets for the storage of inks, rollers and dies. Keep all cans, kegs and barrels containing inks tightly covered at all times.

Special Provision for Rollers

The closet for the rollers contains a rack so that the rollers can be put away in a horizontal position, and the rack is made so that each roller will at no point come into contact with its neighbors. One roller lying on another for any length of time will cause both rollers to become flat at the point of contact, and these flat places destroy the even distribution of the ink.

A pan of clean water should always be kept in the bottom of the roller closet to prevent the air from becoming too dry.

Rollers are made from a composition of glue and molasses, and not from rubber, as many believe, hence their very nature requires great care in handling, if their effectiveness is to be preserved. Rollers used in colored inks should be washed immediately at the end of the run, or if the run is a long one, they should be washed each night. Colored inks dry very rapidly, and stick to the roller like glue. Some good pressmen, not desiring to wash their rollers at once, cover them with a coat of machine oil. This coating shuts out the air from the ink, and rollers so treated may stand for several days without the ink becoming hard.

For washing rollers, use coal-oil. Never scrape rollers with a metal instrument, and do not use gasoline for washing, as the rapid evaporation of the gasoline, takes along with it some of the native moisture of the roller, and leaves it dead.

It is a good idea, if you are putting away clean rollers for any length of time, to roll them over a clean dusty space on the floor, removing the dust coat before putting them on the press again, with a clean cloth dampened in water. After washing rollers with coal-oil, all traces of oil should be removed with a water dampened cloth.

Never use lye-water for cleaning rollers. This destroys a roller in a very short time. An old set of rollers which have become hard and greasy, may sometimes be given a new lease on life, by giving them a bath in lye, wiping them with a dampened cloth. Rollers used in black ink, suffer no damage by leaving the ink on them, unless the ink is a very quick drying one, and it is just as well to put them away without washing.

Special Precaution Necessary

If you are leaving the rollers on an idle press, do not leave them in position, but raise them up so that they do not touch each other, and place the covers on the fountains. Ink always gives better service when free from dirt.

In cleaning the fountains all ink should be removed as thoroughly as possible, the good clean ink being returned to its respective container, and the dregs thrown out. The dregs will be found at the lip of the fountain against the fountain roller. After all ink has been removed as cleanly as possible with the knife, wash the fountain with lye-water or coal-oil.

Clean cotton rags are without a peer for all washing purposes.

Some ink knives of convenient sizes should be provided for tranferring ink from the containers to the fountains, and for removing the ink from the fountains.

Dies Require Special Attention

Nothing so greatly detracts from the neat appearance of printed work, as the imprints of inky, smutty fingers. Facilities for washing hands installed in the press room will leave the workmen with no excuse for soiled work, and will prove an investment worth while.

A closet for the storing of dies is an incentive for an orderly arrangement of dies for these, and has the further advantage of providing a place where they will be subject to less damage than if left lying around the press room. A slight blow with a hard object easily spoils the face of a die. Dies can readily be cleaned with lye-water and a stiff brush, not so stiff however, as to scratch the face of the die. Wash dies when through with them and put away.

Keep your press well wiped, and the bearings well oiled.

Fast Feed Planer and Matcher Book

An illustrated 92-page book on Fast Feed Planers and Matchers has just been issued by the S. A. Woods Machine Co., Boston, Mass.

It only requires a little ingenuity to arrange that a current of air should blow upon the wood just before the fret saw. It makes the sawing so much easier.

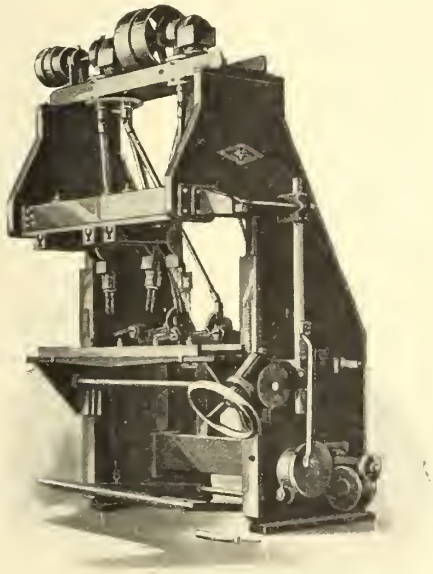
To put a band saw into three coils you hold it in each hand and then twist the top part twice, after that drop over the twisted part.

Saws that are tempered a trifle on the hard side require more care in the setting of the teeth, yet they hold their cutting edge considerably longer than saws which are on the soft side.

Machinery & Equipment

Double Direction Boring Machine

A new double direction boring machine has recently been developed by the Valley City Machine Works of Grand Rapids. This is shown in the accompanying illustration. The machine is equipped with vertical and horizontal spindles and is capable of semi-universal adjustment for angularity. The spindles are also capable of universal adjustment of center placement. Following are some of the specifications applying: Length of machine 73 inches; width



Double Direction Boring Machine

53 inches; height 100 inches; base 29 x 52 inches; working height 40 inches; machine takes in 44 inches between columns and spindles are adjustable to cover an area of 6 inches x 36 inches; weight 4600 lbs. Closest center distance between spindles is 4 inches. Each spindle swings 10 and 15 degrees from 90 plus or minus, and the end bearings are fitted to receive clusters for close center multiple boring as required by individual clients. The machine is normally fitted for eight spindles—four vertical and four horizontal—but any number of spindles required can be furnished. The equipment has two speeds and three variable feeds. The travel of bits is adjustable to 3½ inches. All spindle units are interchangeable and integral with independent adjustment for angularity and position. Feeds of vertical and horizontal spindles are independently driven with a quick return motion of 2 to 1 ratio. These feeds are controlled by a treadle actuated clutch. The machine is especially adapted to chair work and for post boring. Its many new features commend it to discriminating manufacturers, especially those seeking increased production. The machine can be furnished with motor or belt drive.

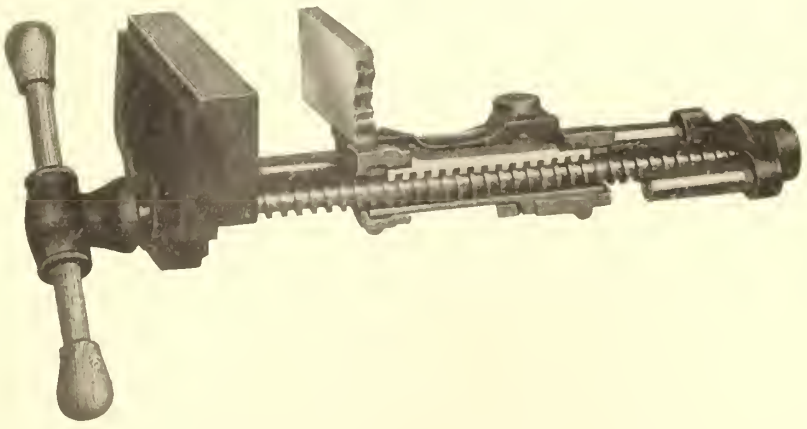
Quick Action Vise

Modern equipment is essential to progressive manufacturing. One of the items that has undergone considerable development and improvement during recent years is the humble bench vise. The old type, with either wood or steel screw, which had to be tediously turned in or out, has been replaced by the modern style of quick-acting vise. With this latter design, a half-turn of the screw either releases or locks the nut on the screw. In this way the jaws of the vise can be opened or closed with extreme rapidity. The accompanying illustration shows, in detail, a type of quick-acting vise which has been placed on the market by the Globe Vise & Truck Co. of Grand Rapids, Mich. It will be noticed that there are no delicate castings to give trouble, every part being built to stand a considerable amount of wear. The screw is made of 1 1/8 in. carbon steel with threads cut away longitudinally, permitting a free movement of the screw backward and forward, giving a quick reliable action with a sure grip when pressure is required.

The Russian forest authorities consider that the forest of Russian Far East is somewhat over 750,000,000 acres in extent.

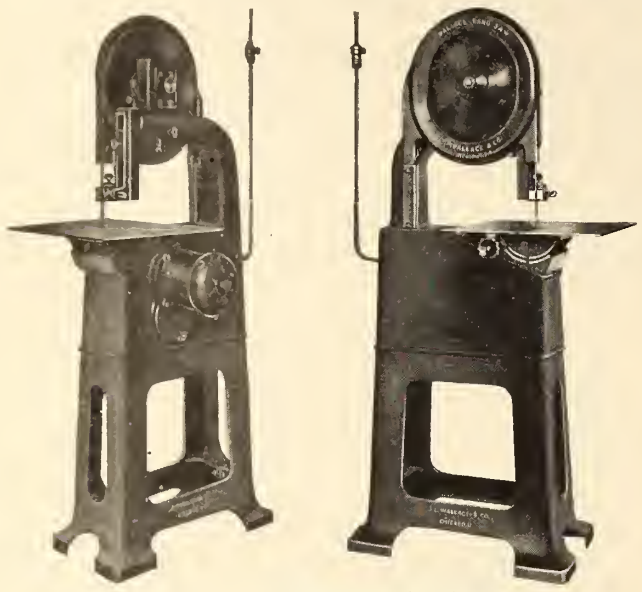
The life of a small mortise chain depends largely upon the care taken in sharpening and working it.

Sectional view of "Globe" quick acting vise



Small, Portable Band Saw

A new addition to the Wallace line of portable woodworking equipment is shown in the accompanying illustration. This is a 16 inch band saw. Among the new features found in this tool are steel disc wheels, ball bearings, even the upper and lower guides being of a ball bearing type. The motor is connected to the lower wheel by fibre gear and steel pinion, both running in oil to ensure perfect lubrication and quietness of operation. The table is 19 by 21 inches



Two views of Wallace portable electric driven band saw

and is mounted on a rocker bearing which permits of adjustment to any angle from 45 degrees to minus 5 degrees. The height of this machine is 5 feet, 9 inches over all, the table being 42 inches from the floor. The floor space required is 15 by 29 inches. The motor, which is ball bearing, is ½ h.p. and runs at 1750 r.p.m., driving the saw at the rate of 3150 feet per minute. The machine is driven from any light circuit and may thus be set up in any part of the plant or moved from section to section as required. Further particulars may be had from J. D. Wallace & Co., Chicago, Ill.

"The Desire to Win"

They had just finished the last rubber of bridge—a young man and the president of a large corporation. The stakes were small and the young man paid the toll. To show his indifference to the loss, the young man said: "I don't care whether I win or lose; I enjoy the game."

The president looked at him and said: "If I didn't want to win I wouldn't care to play. If I lost the desire to win I should not care to live. The desire to win is the one thing that makes life worth living. It is back of every great achievement. No man can be happy—no man can be successful—who does not desire to win.

"A determination to win—not once in a while but all the time—is responsible for the success of every big man. A man cannot always win, but he can always try to win, and the more he tries to win the oftener he will win.

"It was the determination to win which eventually won the war.

"It is the desire of the doctor to win that enables him to pull the patient through. The doctor is not fighting for his fee—he is fighting to win.

"I have employed a good many men in the last forty years" said the president, "and I never employed one until I was satisfied that he had above all other qualifications a firm determination to win.

"But you can't win at bridge if you don't have the cards!", said the young man.

"Some men do", replied the president. "If you doubt it, try duplicate bridge. One man plays the hand and loses one trick; the hands are reversed and his opponent gains one. You will say the opponent was a better player. So he was. But he was a better player because he possessed the desire to win. The desire to win made him study the game—know it—and play it well.

"Whether you are playing or working, it is the determination to win that decides the issue."

New Beltless Swing Saw

The Oliver Machinery Co., of Grand Rapids, Mich., have applied the beltless principle to one of their swing cut-off saws. The advantages of this idea are obvious; the elimination of belts, pulleys and countershafts, and the fact that friction is reduced to a minimum through the elimination of numerous bearings and the use of ball bearings. This machine is

Beltless swing saw developed by Oliver Machinery Co. Grand Rapids

furnished only for 2 or 3 phase, 60 cycles, 220 or 440 volt, alternating current, and to 3 h.p., and runs at 3600 r.p.m., developing 3 h.p. A 16-inch saw is carried on the end of the motor arbor. The control, as shown, is part of the motor head block and is thus always within easy reach of the operator. The control is of the push-button type. This saw, together with the Oliver new style swing saw table, which is of the roller type construction and fitted with special automatic stops, makes a very complete and efficient combination.

When your sanding belt is burning the end grain of the wood you can be sure that the belt is running too fast for that particular job.

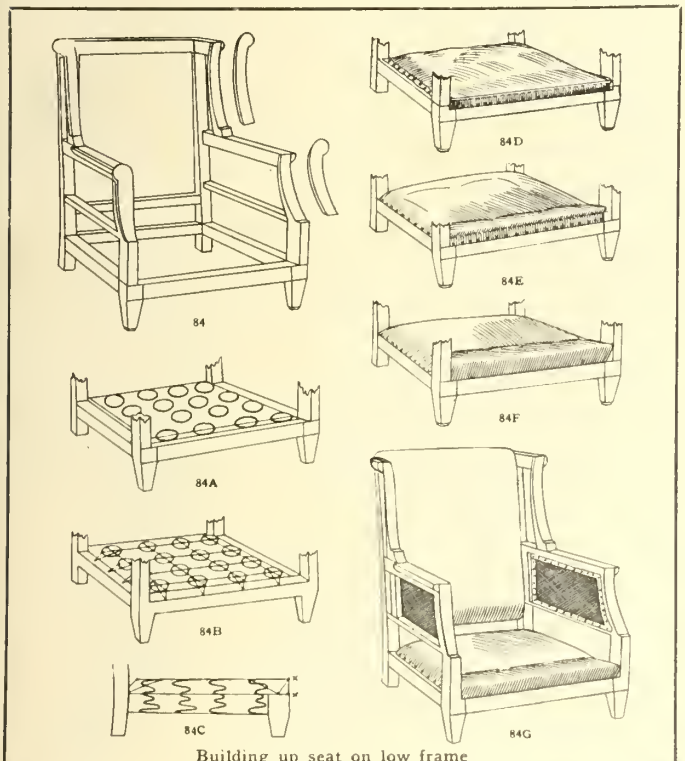
Upholstering and Trimming

Planning Deep Seat For Low Chair

Comfort First Consideration—Spring Edge Recommended Where Frame is Low

In the upholstering of any type of chair frame there has to be kept always prominently in mind the requirements of bodily comfort and any shape which does not conform to the dimensions of the human body, is a failure from the standpoint of serving its chief purpose as an article of furniture, says John W. Stephenson in the "Upholsterer." In the consideration of the frame represented in Fig. 84, the chair frame, which has purposely a very low seat, requires a different form of treatment from that which has been indicated for the chairs already covered in this series.

The frame of Fig. 84 has very short legs, enabling the upholster to provide a deeply-cushioned seat, in



Building up seat on low frame

order to bring the finished height of the seat the necessary distance from the floor, which, as ws have said elsewhere, is about eighteen inches.

Using Spring Edge

For this reason, we suggest in the unholstering of Fig. 84, the employment of the spring edged seat, and we have indicated in the first of the sketches, in connection with Fig. 84, the details of forming a spring edge.

We have not attempted here to teach the rudiments of spring-edge work, because it is to be assumed that the upholsterer who is interested in the advanced methods of upholstering which we are describing in connection with these high-class types, has already mastered the rudiments of the foundation work.

Fig. 84a, shows the placing of the spring; four rows of four springs each, the front row being preferably springs specially constructed for spring-edge work, having either a square front or finished with a large top coil, which makes it less difficult to bring the front edge of the top coil in line with the front edge of the chair rail, as indicated in Fig. 84b, and by XX in 84c, a cross-section of the chair which shows the placing of the springs.

Fig. 84d shows the seat sprung up and canvassed, the wire or cane, enclosed by stitching, being about 1½ to 2 inches above the rail.

The next step in connection with the upholstering of this seat is the forming of the stitched edge, which is provided by doubling stuffing the seat, as indicated in Fig. 84e, which shows the edge ready for stitching. In the stitching of the edge, care should be taken to keep it soft and somewhat blunt, because it is necessary to have every part of the upholstering of the chair we are describing as soft as can be, and still retain sufficient firmness to hold its shape.

Following the stitching of the edge, the next process is the final layers of hair and the covering in muslin, bringing the process to the point indicated in Fig. 84f. It will be noticed that this chair is provided with loose strips which form the final finish of the arms and wings. These are removal for all the preliminary processes of upholstering, and are only used to promote uniformity in the completed appearance of the chair.

The back of this chair is upholstered with springs in the manner detailed in Fig. 14, and then has the appearance indicated in Fig 84g.

Duo Tones in Upholstered Furniture

The delightful duo tones which have been used with such good effect on the better grades of case goods, have found their way into the upholstering departments. Many manufacturers are turning out pieces covered usually in two distinct shades. If well done, the result is rather attractive, and makes a pleasing departure from the regular styles of upholstered furniture.

Like other fads, which have had their day, this tendency will, probably, be carried to extremes and be overdone by some upholsterers. Good taste and an eye for color are required to work out attractive color combinations. This is more true to-day than ever before, for the day when anything will sell, whether or not it violates the canons of good taste, is past. The public are showing greater discrimination than ever in making their purchases with the result that unless one observes the dictates of good taste and shows good judgment in selecting combination coverings, it is not likely that the product will find a ready sale.

Temperance in all things is not a bad motto. The public will only go so far in their fondness for that which is bizarre or faddy. The staple lines are the ones which the prosperity of any business depends and are the ones which should be fostered and developed through good and bad times.

Trend of Design in Upholstered Furniture

One phase of development in the manufacture of upholstered furniture is the use of fancy carved feet in various period designs and the development of designs which permit a certain part of the wood frame to show. In the latter event, the bottom rail, which

Carved fibre foot for upholstered furniture. May be had in a variety of designs

is the part usually exposed, is worked out and ornamented to conform to the style and outline of the feet and the whole finished in keeping with the general effect and tone of the finished article.

In the newer designs the use of carved ball and square feet in the Louis XIV, XV and XVI styles, together with the pleasing curved Queen Anne proportionately carved, make a marked advance in bringing upholstery into the realm of the periods and in no way lessening the comfort that is always inviting.

Like all things beautiful, especially where the hand tool is required, the cost of trimming is almost prohibitive, and it is safe to say that the period furniture would never have reached the popularity it has, were it not that a reliable substitute for the hand tooled wood carving can be had.

The substitute offered by a Canadian manufacturer has proven satisfactory in appearance, strength and durability. The construction is of wood and highly compressed fibre, and is treated in every respect as if it were a wood. When properly screwed, glued, dowelled and finished, it is an integral part of the frame. From the supreme viewpoint—service—it cannot be excelled by its genuine counterpart, wood.

Chesterfield feet will undoubtedly be subjected to a more severe treatment than any other piece of household furniture, principally because of their location and also because of the weight and bulk of the piece in question. But in spite of the unintentional and unguarded knocks, the fibre substitute has proven its worth, largely because the mass has no core grain. The grain seen is but surface effect. The likelihood of cracking or chipping is beyond question. Its adaptability is all that can be expected of wood itself. It will lend itself to the tool, can be glued and screwed, and is adaptable to the standard castor and gliding shoe.

The economic factor is most interesting when compared with the hand carved counterpart, amounting to but one tenth of the actual cost of its reproduction in wood.

Importance of Correct Glue Temperanure

In an address before the furniture manufacturers, foremen and superintendents at the recent annual meeting of the Furniture Manufacturers' Association, Mr. Feldkamp, of the Canada Glue Co., emphasized the importance of maintaining glue at the proper temperature and laid stress on the fact that this adhesive loses it strength rapidly as the temperature is increased. The best temperature is in the neighborhood of 125 to 140 degress Fahr., although the glue may be heated as high as 150 degrees without showing any signs of deterioration. Above this heat the strength rapidly leaves the glue and it is claimed that animal glue is practically useless as an adhesive by the time it is heated to 185 degress,—just 27 degrees below the boiling point.

Naturally all glue users are desirous of having their glue at its greatest strength although many do not give the question of temperature the consideration it deserves. There is another side to it, however, and that is using overheated glue is one cause for such troubles as open joints, loose veneers and other faults due to weakened joints. To secure the best results and to produce a product which will give a fair degree of satisfaction, it is necessary that greater attention be given to the temperature at which animal glue is held.

Why wait to get a length of belting to repair a break? Keep a good stock, it is always handy.

Eagle-Ottawa Leather Co.

TANNERS OF

FURNITURE LEATHER

OF EVERY DESCRIPTION

We are making a specialty of cutting

Spanish Split Leather for Chair Manufacturers

Quotations and samples furnished on application

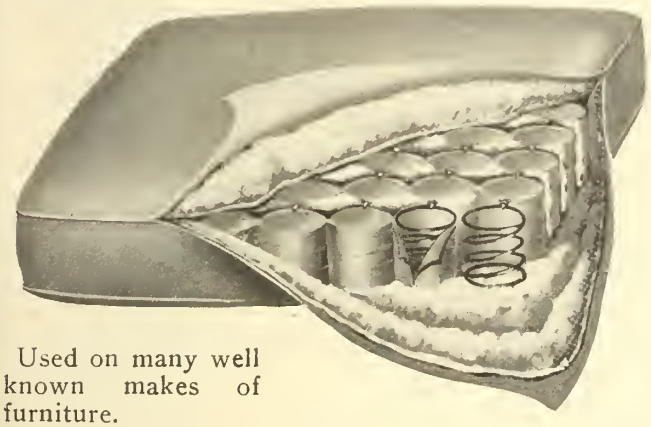
We will be pleased to supply a very attractive sample book, of all our grades on application.

GRAND HAVEN - - - - - MICHIGAN

"COMFY" CUSHION COMPANY
Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.

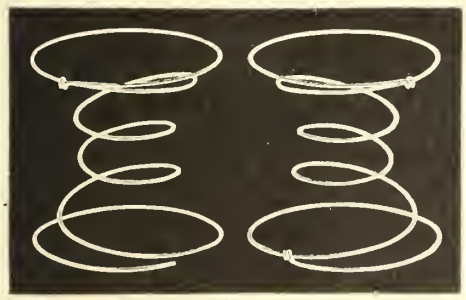


Used on many well known makes of furniture.

Write for Catalogue

"Comfy" Cushion Co.
340 Gerrard Street, East, TORONTO, Can.

"IDEAL"
FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,
of Canada, Limited
Windsor - Ontario

The
ORIENTAL TEXTILES COMPANY
LIMITED
Oshawa, Ontario

Manufacturers of
Upholstery
Mohair
and Velours

Agent
J. H. ALLEN
33 MELINDA STREET
TORONTO

Twines and Cordage

"Doon" Twines are known throughout the woodworking industry for their absolute dependability and uniform quality. They are entirely "made in Canada."

Spring Twines, Stitching Twines, Seaming Twines, Tufting Twines, Wrapping Twines, Flax, Hemp and Jute Twines for all purposes.

Write for samples and prices.

DOON TWINES, LTD.

Mills at Doon and Kitchener

Head Office: Kitchener

COLORED ENAMELS

MARIETTA WOOD AND METAL FINISH SPECIALISTS

The growing popularity of colored enamels for breakfast room and bedroom furniture has made this feature of our business a strong one with manufacturers specializing in

Enameled Furniture

We make them in all colors—the popular ones being Ivory, Blue, Yellow, Mauve, Mahogany, Pink, French Gray, Jade Green and Delft Blue.

Beautiful effects are obtained by enameling with one color and decorating with another.

Can be sprayed or brushed.

We are supplying some of the largest manufacturers. Write for full information.

The Marietta Paint and Color Co.

Marietta, Ohio

D&P

QUALITY

CURLED HAIR SANDPAPER GLUE

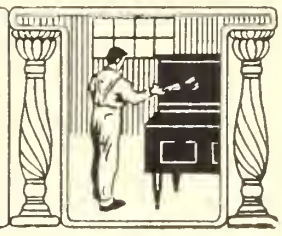
DELANY & PETTIT LIMITED

TORONTO.

OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC

THE FINISHING ROOM



Lacquer Finishing on Furniture

Lacquer has Many Commendable Features—Not Easily Marred and Does not Check Nor Craze

By G. W. Phillips*

Now, on the threshold of what bids fair to be a most wonderful era in the furniture business, we are compelled to pause and look for new finishes and finishing materials to keep pace with the wonderful strides made in style and artistic design.

For many years, the metal finisher has employed pyroxylin lacquers to protect and beautify his work. It has long been realized that these pyroxylin lacquers gave finishes far more durable than those produced by any other materials. With the passing of highly polished, mirror-like surfaces, built up from many coats of varnish, and the advent of the new art finishes, it becomes possible to apply these wonderfully durable lacquers to furniture finishing.

Have Certain Desirable Features

The lacquer finishes possess certain very desirable characteristics in addition to their simple beauty. The highly polished surfaces of yesterday were easily marred and at all times almost impossible to keep presentable. The lacquer finishes of to-day are hard, but elastic, they will not scratch, nor show white marks, niether will they paper mark, check or craze. They are water-proof and are unaffected by heat or cold.

The application of lacquer to furniture finishing presents no great difficulties to the finisher. The lacquer may be applied either by brushing or spraying, spraying, of course, being preferable. Some of the wood lacquer on the market must be reduced with a special thinner to the correct consistency for spraying, while others are supplied by their manufacturers at a body which works satisfactorily either for spraying or brushing. In applying the lacquers with a spraying apparatus, it should be remembered that the best results are obtained with not more than thirty pounds pressure; the nozzle of the spray gun being kept at a distance of about seven or eight inches from the work.

The best brands of art lacquers are liquids of great clearness and almost water white in color, so that they do not change the most delicate shades of stain. The dried lacquer film sands easily to a velvety surface which is very popular. It is possible to shade over the lacquer with excellent results. Lacquers are also employed very successfully as a wash for water stains before sanding, or for making a good water-proof ground for filler.

Art Finish on Walnut

Lacquer has found very extensive use in the production of art finishes on walnut. This type of finish which is very popular in some of the factories is not difficult to use. Apply water stain of desired shade. When the water stain is thoroughly dried, apply one coat of lacquer, let dry from one to two hours, and then sand lightly. Fill, if necessary. After sanding apply two coats of art lacquer and finish with a flat varnish or wax.

Desirable Finish for Fumed Oak

Lacquer gives splendid results on fumed oak. Use an acid stain or a fuming box, or both if necessary, then apply one or two more coats of lacquer, "shade in" and finish with either wax or flat varnish. This procedure gives a very soft, velvety finish, artistic in appearance and durable beyond mention.

The methods which have been described above are only two of many which are in use. New methods of using lacquers are being developed all the time in the various factories. The lacquer is being used not only on oak and walnut but on practically all of the other woods which are used in the manufacture of furniture. Lacquer finishes appeal to both manufacturers and buyers. Their popularity is sure to increase, and in view of the fact that their application is only in its infancy it is safe to predict great developments along these lines.

*Flint Varnish & Color Works of Canada, Limited, Toronto

Fake Finishing Formulas

The "Canadian Woodworker and Furniture Manufacturer" for September, 1921, contained some information pertaining to a man who was calling on different woodworking plants endeavoring to palm off worthless formulas for celluloid enamels. As stated in this warning, this chap is very plausible and tells a good story but several readers of the "Canadian Woodworker" have found from experience that the information given is entirely useless. It has come to our notice that this man is in Ontario again and is working the old game.

Acetone will dissolve celluloid, making a liquid which may be applied by either spray or liquid. So far, so good. When this coat dries it is found to be soft and chalky and is totally unfit for a finish.

Spraying Enamel Interiors

Furniture manufacturers are gradually veering around to the idea of using spray equipment for the application of all finishing materials. This has been found to be more efficient than, and to offer advantages over, the older method of applying finishing materials by hand. Sometimes, however, certain problems are encountered such as when the inside of a case is finished in a different color from the outside, such as occurs in the case of kitchen cabinets and refrigerators.

When overlapping of different materials like this is encountered, the outside finish is usually applied first. When it comes to finishing the inside, some op-

erators use a shield made from cardboard or thin metal to keep the spray away from the outside surfaces. Another method, one that has proved very satisfactory, is to place the work on a turn-table, to facilitate handling, and as the inside is being sprayed near the stained edge, the stained part is turned away from the operator, and the enamel or paint is sprayed at an angle toward the outside of the cabinet and toward the fans, so that all surplus material is carried past the stained face and is exhausted.

This process may be reversed and the stain applied after the interior has been finished. The same procedure is followed. The work is turned around and the stain applied at an angle that permits the exhaust to carry the surplus away in such a manner that none of it will enter the interior of the cabinet.

Good Varnish—How to Test It

Outline of Tests and Specifications for Varnish for Interior Work—How Various Tests are Made—What Constitutes Good Varnish

The Bureau of Standards, Washington, D. C., recently issued a circular covering specifications and tests for varnish. While these apply primarily to varnish for interior work, the methods of testing outlined and the qualities required are such as to prove of interest and value to all varnish users. It was prepared and recommended by the U. S. Interdepartmental Committee on Paint Specification Standardization and is as follows:

General Qualities

The varnish shall be suitable for general interior use, including both rubbed and unrubbed finish, exclusive of floors. It must be capable of easy application with a brush in the ordinary manner according to the rules of good standard practice, must flow out to a good level coat free from runs, sags, pits or other defects, and dry with reasonable promptness to a hard, somewhat elastic glossy coating which can be rubbed in 48 hours or less. The manufacturer is given wide latitude in the selection of raw materials and processes of manufacture, so that he may produce a varnish of the highest quality. The varnish must meet the following requirements.

Appearance,—Clear and transparent.

Color,—Not darker than a solution of 3 g of potassium dichromate in 100 cc of pure sulphuric acid, specific gravity 1.84.

Flash Point (closed-cup),—Not below 30 degrees C (85 degrees F.)

Non-volatile Matter,—Not less than 45 per cent by weight.

Set to Touch,—In not more than 48 hours.

Dry Hard,—In not more than 24 hours.

Dry to Rub,—In not more than 48 hours.

Toughness,—Film on metal must stand rapid bending over a rod 3 mm (⅛ inch) in diameter.

Working Properties,—Must have good brushing, flowing, covering, levelling, and rubbing properties, and must show no impairment of lustre or other defect when used where natural or illuminating gases are burned or when subjected to air currents during the process of drying or application.

Water Resistance,—The dried film must stand application of cold water for not less than 18 hours without whitening or showing other visible defect.

2. Taking Samples for Tests

It is mutually agreed by buyer and seller that a single package out of each lot of not more than 1000 packages be taken as representative of the whole. Whenever possible, an original unopened container shall be sent to the laboratory, and when for any reason this is not done, the inspector shall thoroughly mix the contents of the container sampled, transfer not less than 1 quart to a clean dry glass bottle or tin can which must be nearly filled with the sample, securely stoppered with a new clean cork or well-fitting cover, or cap, sealed, and distinctly labeled by the inspector.

The inspector should take a duplicate from the container sampled to be held for check in case of dispute, and, when requested, should take a sample for the seller.

The tin panels used in the following tests shall be cut from bright tin plate weighing not more than 25 g nor less than 19 g/dm^2 (0.51 to 0.39 lb./ft.^{2}). (Commercial No. 31 gage bright tin plate should weigh about 0.44 lb./ft.^{2} It is important that the tin plate used shall be within the limits set.)

3. Laboratory Examination

(a) Appearance,—Pour some of the thoroughly mixed sample into a clear glass bottle or test tube and examine by transmitted light. The varnish must be clear and transparent.

(b) Color,—Prepare a standard color solution by dissolving 3 g of pure powdered potassium dichromate in 100 cc of pure concentrated sulphuric acid of specific gravity 1.84. Gentle heat may be used if necessary to perfect the solution of the dichromate. The standard color solution and a sample of the varnish to be tested shall be placed in clear, thin-walled glass tubes of the same diameter. The color comparison shall be made by placing the tubes close together and looking through them by transmitted light. The tubes used for this test should be 1.5 to 2.0 cm (5/8 to 13/16 inch) in diameter and shall be filled to a depth of at least 2.5 cm (1 inch). (Since the potassium dichromate-sulphuric acid must be freshly made for this color comparison, it is frequently more convenient to compare samples with a permanently sealed tube of varnish which has previously been found to be slightly lighter in color than the standard solution of 3 g dichromate in sulphuric acid. When samples are found to be darker than this standard tube of varnish, the dichromate standard should be made up for final decision.)

Making Flash Point Test

(c) Flash Point.—Determine with either Tag or Elliott closed-cup tester. The former is preferred, and directions for its use are found in A.S.T.M. Standards D 56-19. For method of determining with the Elliott cup see proceedings A.S.T.M., 1917, part 1, page 414.

(d) Nonvolatile Matter.—Place a portion of the sample in stoppered bottle or weighing pipette. Weigh container and sample. Transfer about 1.5 g of the sample to a weighted flat-bottomed metal dish about 8 cm diameter (a friction-top can plug.) Weigh con-

tainer again and by difference calculate the exact weight of the portion of sample transferred to the weighted dish. Heat dish and contents in an oven maintained at 105 to 110 degrees C. (221 to 230 degrees F) for three hours. Cool and weigh. From the the sample taken, calculate the percentage of non-volatile residue.

(e) Drying Time.—Pour the varnish on a clean glass or bright tin plate not less than 15 cm (6 inches) long and 10 cm (4inches) wide. Place the plate in a nearly vertical position in a well-ventilated room but not in the direct rays of the sun. The temperature of the room should be from 21 to 32 degrees C (70 to 90 degrees Fahr.) The film is tested at points not less than 2.5 cm (- inch) from the edges of the film, touching lightly with the finger. The varnish is considered to have set to touch when gentle pressure of the finger shows a tacky condition but none of the varnish adheres to the finger. The varnish is considered to have dried hard when the pressure that can be exerted between the thumb and forefinger does not move the film or leave a mark which remains noticeable after the spot is lightly polished. If rapid light rubbing breaks the surface, the sample is considered not to have satisfactorily dried hard. In case the test shows time of setting to touch or drying hard more than 4 and 24 hours, respectively, two additional tests shall be run on different days and if the varnish does not meet the above drying and hardening requirements on both of these additional tests, it shall be considered unsatisfactory.

(Continued in March issue)

Lubrication of Woodworking Equipment

High Spindle Speeds Require Special Attention to Lubrication

The tendency of modern machine tool practice is towards higher speeds with heavier cuts, increased output being the driving factor. This dictum holds equally good for woodworking machinery as with all else. It may be that it applies with perhaps even greater force since in this industry high speeds have long been the rule with some classes of machinery.

This increase of rotational speed, and the heavier strains imposed as a result of higher tool capacities, must of necessity soon reach a limit unless accompanied by a corresponding increase in the texture quality of the material employed, and more adequate means for lubricating the rubbing surfaces.

The day has long gone by when an occasional drop or two of oil into an open oil hole, and so to a bearing, must serve until a protesting shriek announces the fact that it is time for another dose. So also is the day gone of the oil box and oiled wad of tow or cotton-wool. Gone also is the cylindrical lubricator carrying a central small tube down which is thrust a wire carrying a tail of plaited worsted, which is supposed to function as a siphon.

These devices were, doubtless, very efficient in their day; so also was the post chaise, Stephenson's "Puffing Billy," Arkwright's spinning loom, Newcomen's pumping engine. But that day is not to-day; something infinitely more reliable and effective being demanded.

Woodworking machinery is, above all else, the most difficult to deal with in this respect. The dust arising out of the various conversion processes is much more apt to become a choking, clogging agency than, say, the cuttings from metal-working tools. It is not only absorbent, but it has a tendency to glutinise or gum up the oil. For this reason more than ordinary precautions need to be adopted in designing lubricating points of woodworking machinery. It is, therefore, advisable that these should never be exposed; never situated where they are liable to be covered over and forgotten by dust, chippings, or other refuse; never wholly dependent upon the vagaries of human nature for their regular attention.

What Scientific Lubrication Means

We are told that a properly lubricated journal running in a bearing does not actually touch in a metal-to-metal sense, that it runs on a thin oil film which, if the pressure be not excessive, never becomes broken. How far this is true in actual practice I cannot really say, but this much, at least, is certain: that a mechanically perfect bearing need not, necessarily, become the least bit worn, providing it is all the time being efficiently lubricated.

Given every protection against outside influences that have a deterrent effect upon the means for efficient lubrication, given human endeavors to avert as far as possible unnecessary obstacles to smooth running, it is all of little avail unless a scientific discrimination is exercised in the selection of oils for lubricating purposes.

The higher the speed of a machine the thinner and lighter is the oil required. If an oil of heavy body is employed on, say, moulding or cutter spindles which may run at from 5,000 to 8,000 revolutions per minute, the cohesive force holding the particles of oil together cannot be overcome with sufficient rapidity, hence undue friction is set up, and heating occurs. Therefore oils of light body and low viscosity are to be preferred.

On the other hand, with slower-moving machinery and heavier bearing pressures, as exemplified in log band mills, frame and rack saws, and so on, a heavier oil of high viscosity is desirable.

Then, again, temperature must to a great extent govern the selection of an oil. Oils that are suitable to heated rooms, factories, or woodworking shops would be altogether unsuitable for machinery that is more or less exposed to all weathers.

The aim always is to use the thinnest oil that will reduce friction. It may also be accepted as a general rule that the use of too heavy an oil invariably means waste of power.

Pointing the Moral

Now if there is a lesson to be learnt, it is that in order to obtain the most economical results and the highest efficiency from your machinery, it is advisable to seek expert advice in the selection of lubricating oils. As a practical timber converter or woodworker you naturally would not expect an oil refiner to help you out of a technical difficulty. You would not tolerate his advice or methods or operations. You would consign him to a destination where heat waves are common if he ventured to poach on your own particular preserves.

Then why take it for granted that you know all that is worth knowing about a lubricating oil? Neither you nor I know what in this respect is best for our peculiar needs. Then give the man that does know a chance!—"Timber."

Wood Products Wanted

The increase in the number of inquiries for wood products being received by the Department of Trade and Commerce, Ottawa, seems to indicate that the British market for articles of wood is improving. A few of those received recently which may be of interest to readers of the "Canadian Woodworker" are published herewith. The names of the parties making these inquiries may be secured from the Commercial Intelligence Branch of the Department of Trade and Commerce, Ottawa or from the publishers of this paper. Give number of inquiry when asking for information.

3766. Dowels and cornice poles.

3767. Hickory golf sticks.—Unturned, 7/8 in. by 44-inch straight grain second growth white hickory golf sticks.

3768. Last blocks.—Kiln dried, if possible.

3829. Roller blocks.—Sawn maple roller blocks delivered, Plymouth.

3830. Clothes pegs.—Clothes pegs with wire spring.

3831. Dowels.—Lengths 30 and 36 inches and of diameters 1/4-inch, 5/16-inch, 3/8-inch, and 1/2-inch.

3860. Box shooks.—A Liverpool firm desire to get into touch with a first-class shipper of box shooks.

3862. Hickory and ash handles.

3863. Birch, beech and maple dowels.

3915. Dowels.—Maple and birch dowels.

3916. Clothes pegs. 4 1/2-inch clothes pegs, packed 5 gross in a box. Are prepared to purchase 1,500 boxes.

E. T. CARTER & CO.

84 FRONT STREET EAST

TORONTO

Dealers in

Fibro Products, Linters, Reeds, Rattans, Waste.

Quality Guaranteed. Prompt Shipment

"ENAMELS"

Our business in both White and Old Ivory Enamels and Primers has trebled during the past year.

WHY?

They are the best on the market. If you are not using them, write for samples and prices.

The **Ault & Wiborg Co. of Canada, Ltd.**

Varnish Works

Montreal Toronto Winnipeg

FLINT

BLUE DIAMOND ART LACQUER

Have You Tried It?

If not, send for a generous sample and full information. It is a wonderful new product for use on furniture. By its use you can achieve many beautiful finishes that are durable beyond comparison.

BLUE DIAMOND ART LACQUER is made in Canada, by men who understand the problems of the finisher and produce a complete line of products for his use.

Flint Varnish & Color Works of Canada, Limited

Perth and Kingsley Aves., West Toronto

Owned and operated by CANADIAN EXPLOSIVES LIMITED

Why Waste Money in Your Drying Room?

Air-drying of coatings of any kind is out of the question. No manufacturer could afford it even if the best drying conditions always prevailed—which they do not.

But with Nichols Varnish Drying Equipment you always have very much better than the best natural conditions, reducing days of drying to hours, and the drying is better done: "From the inside out."

This is accomplished by producing always and automatically the correct combination of temperature and moisture, and of air that is absolutely clean.

Why is a Spray Head?

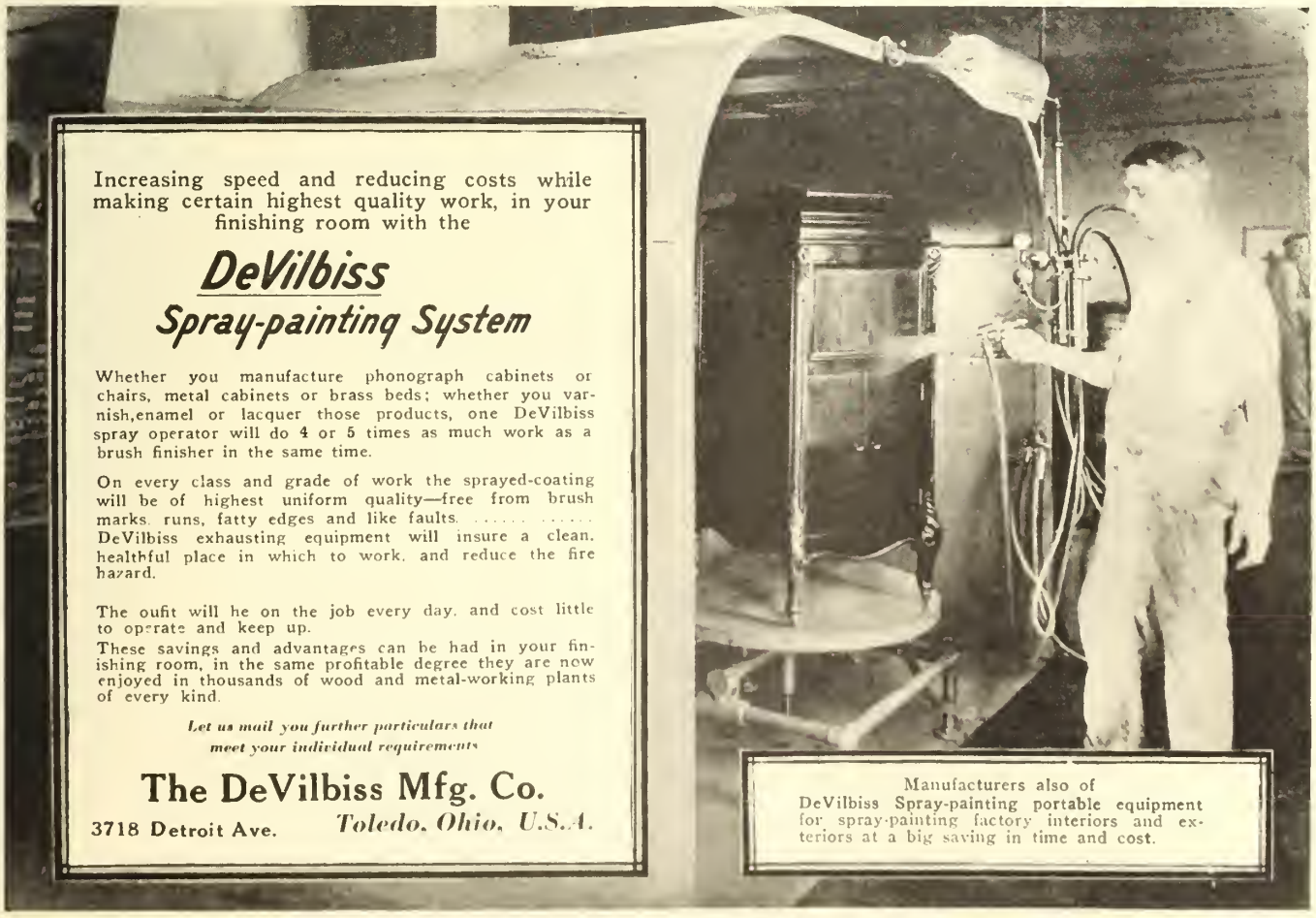
Furthermore, the spray for washing the air in Nichols Drying Equipment is produced in a simple and ingenious manner without the use of the spray nozzles, connecting pipes, pump, and strainers, all of which require so much attention and give so much trouble.

We urge manufacturers to ask us for description of apparatus and for records of its accomplishments, saving single manufacturers many thousands of dollars in reducing the time the product is held up in drying, and increasing the quality besides.

A. S. NICHOLS COMPANY Aeolian Hall New York City

Manufacturers alo of

Nichols Lumber Dryers, Veneer Dryers and Hydraulic Pumps



Increasing speed and reducing costs while making certain highest quality work, in your finishing room with the

DeVilbiss
Spray-painting System

Whether you manufacture phonograph cabinets or chairs, metal cabinets or brass beds; whether you varnish, enamel or lacquer those products, one DeVilbiss spray operator will do 4 or 5 times as much work as a brush finisher in the same time.

On every class and grade of work the sprayed-coating will be of highest uniform quality—free from brush marks, runs, fatty edges and like faults. . . . . DeVilbiss exhausting equipment will insure a clean, healthful place in which to work, and reduce the fire hazard.

The outfit will he on the job every day, and cost little to operate and keep up.

These savings and advantages can be had in your finishing room, in the same profitable degree they are now enjoyed in thousands of wood and metal-working plants of every kind.

Let us mail you further particulars that meet your individual requirements

The DeVilbiss Mfg. Co.

3718 Detroit Ave. *Toledo, Ohio, U.S.A.*

Manufacturers also of
DeVilbiss Spray-painting portable equipment for spray-painting factory interiors and exteriors at a big saving in time and cost.

BEAUTY SELLS
In the average home of your ultimate consumer, your product must take its place among rugs, pictures, tapestries and other furnishings which bespeak the buyer of discrimination and taste.
It is to the good judgment of the man who is creating an atmosphere of artistic refinement in the home that you must appeal.
Make the appeal with "Birds Eye" Figured Veneers. Their wealth of Natural design makes a direct bid for business among lovers of beautiful woods.
BeVeCo
VENEERS
BIRDS EYE VENEER COMPANY
ESCANABA
MICHIGAN

Veneers and Panels

Counteracting Moisture in Veneer Work

Many Troubles Due to Moisture in Material --Points to Watch—How Moisture can Best be Eliminated

By John Welmers

The veneer room is frequently the source of many of the troubles experienced all the way through the factory and even up to and in the customers' homes. The methods and equipment used may be of the best, but even at that, if brain work is not the leading factor in the veneer departments we may expect to trace certain troubles back to the veneering operation. Taking for granted that the glue used is good, that the methods of laying and pressing are O.K., there is still another factor which follows and if this factor is not taken into consideration there still exists one of the greatest stumbling blocks toward the production of the best work.

It is a known law that wood stays uniform as long as it is kept in uniform surroundings and that if the conditions vary the wood will vary likewise. If the air becomes more moist or humid, wood will take on a relative amount of moisture and swell correspondingly, or if on the other hand the air becomes drier, wood will lose moisture and shrink correspondingly.

Movement of Wood Causes Trouble

In the November issue of the "Canadian Woodworker and Furniture Manufacturer" for 1919, there appeared an article by the author stating why it is necessary to dry glued up core stock before planing it so as to eliminate sunken joints. This same fact that the edges of the core stock joints swell slightly when they absorb moisture from the glue holds true with any glue joint, veneers not excepted. Probably it is not generally realized that such a little thin piece of wood as veneer can swell enough to cause trouble, but there is the hitch. It may not swell appreciably parallel to the grain, but it can and does swell both in width and thickness. The swelling along the width of the grain may not cause trouble if the veneer is glued to a thick core, that is if it is plain straight grain veneer, but if it happens to be a piece of veneer having much end grain on the face it will check, while causing no change in the shape of the core. If, however, either kinds of veneer are glued to a thin core they will cause warping unless there is a similar veneer on the opposite side to counteract and balance the stresses.

The amount of swelling that takes place in the thickness of the veneer and cross banding when coming in contact with glue is considered negligible by some. It is small, in fact so small that it would be hard to measure the difference with the naked eye. But that there is a difference is conceded by many. It can hardly be seen on glancing over an unfinished top or panel that has had no, or little, drying after it was glued, but finish the top and then glance over it placing the panel in a horizontal plane between yourself and the window or a light. It will then be noticed there are many irregularities parallel to the grain of the face veneer and in case the panel, if it happens to be five or seven ply glued in one operation, the faint lines or irregularities of the cross banding may also be seen.

Cause of Irregularities

Some people are apt to become so calloused to seeing these irregularities that it becomes merely a matter of fact that all panels should do likewise.

Slight irregularities deflect light quickly when held toward the light although the difference may be imperceptible otherwise. It is quite similar to a window made of plain window glass. When you look at your reflected image it appears distorted and plainly tells you the surface of the glass is uneven. It distorts even though the irregularities can hardly be measured. It would be well if finished veneered panels had to be used for mirrors for then some peeople would awaken to the fact that the surfaces are uneven.

"What is to be done to prevent this?" you might ask, and the answer is simply, "Give your panels sufficient time to dry before attempting to surface them with a sander or otherwise". If you don't, you will make the panels even for a little while, but they will shrink in places as they become dry and cause unevenness.

Artificial Drying Best

If you do not have a small kiln for drying your veneered panels and do not wish to install one you can accomplish this purpose by piling the stock on stickers in a convenient location and allowing them to stand a sufficiently long time. The approximate time for drying a five ply panel in the open is approximately five or six days and seven or eight days for the seven ply. It must be understood that there must be circulation present because that it is what carries the moisture away, and unless there is circulation the air may become stagnated between the panels and some panels will dry very little.

This leads to the setting aside or making a room for this purpose and installing a fan or blower of some kind in order to get a positive circulation. Once you get this far you will begin to realize that a little heat will speed up the process and cut down the drying time. Heat and circulation will dry the panels, no doubt about it, but they may also overdry them which is in fact better than not drying them enough. To improve matters a little more it will be found profitable to humidify the room so that the panels cannot dry beyond the moisture content desired.

There are different ways of constructing a drying room, but to construct one and make it dry right with

out infringing any patents is another thing. In the long run it would not be much cheaper than to have experts construct one for you which will be correct in all details throughout. A properly made kiln, one in which the temperature and humidity can be controlled, can dry veneered stock in a much shorter period of time. In fact five and seven ply panels can be dried to six per cent in approximately two and three days if temperature is held at 120 F. and relative humidity at 35 per cent. One feature about most modern kilns is that they are provided with automatic regulators for both heat and humidity thus doing the work with very little attention.

How do You Dry Veneered Stock?

Furniture Manufacturers Turning to Special Kilns—Has Beneficial Effect on Production—Brief Outline of Main Requirements

S. H. Johnstone

The advantage and convenience of a special drying room for removing glue moisture from veneered stock and panels, is gradually being recognized by many Canadian manufacturers of panels and veneered products. In many furniture, phonograph, piano and panel plants, these special drying rooms are making their appearance. In some cases they are merely rooms in which the temperature is raised and maintained. Again, it may be found that an attempt has been made to create a circulation either through the introduction of a small fan, usually electric, or by connecting the exhaust ducts with the shavings exhaust system and thus taking advantage of the pull of the latter system. And in a few rare instances moisture or humidity is introduced to retard the surface drying and prevent checking or casehardening.

Behind all this is the realization that permitting veneered stock to stand around the shop to air dry, is too slow and too uncertain. Being slow, it acts as a drag or brake on production and often when a rush occurs the material is taken and worked up before it is sufficiently dry. Also being slow, a considerable amount of floor space is occupied by piles of veneered work which are drying out. The uncertainty creeps in owing to the variation in air conditions in the factory and to the fact that there may be little or no circulation. The result is that one time the glue moisture may be eliminated in a week, or ten days, while the may require and should get three weeks.

Stimulates Movement of Stock

One of the main advantages of a drying room in which conditions are kept more or less constant, is that definite drying schedules or times may be determined and followed, with a full assurance that the material comes out dry in every case. This permits a rigid adherence to production schedules and does away with any congestion which may have existed in the veneer department. It also enables the work to be pushed through the veneering operation without much delay.

There is nothing mysterious or secretive to the drying of panels or veneered pieces. The same principles which apply to the drying of solid lumber, hold good here. For the best results there should be heat, humidity and circulation, and each should be under control, either hand or automatic. Heat is usually supplied by steam coils, so arranged and placed that the temperature will be nearly uniform in all parts of the room. For drying work of this kind a temperature in excess of 120° is not advisable. In the case of animal glue, it is a good policy to hold the temperature around 110°. If it is permitted to pass the 120° mark, there is a possibility that the glue will be softened and may even let go in places. This, to say the least, would be diasterous.

Importance of Adequate Circulation

Circulation may be secured by the arrangement of the coils and the location of the intake and exhaust ducts. Usually in small drying rooms one or more electric fans are installed to stimulate the air movement. Without circulation, the drying is slow and erratic and the centre of the piles lag away behind the exposed surfaces. Circulation is absolutely essential and should be secured without fail.

Humidity is desirable. It serves the same purpose here as it does in the lumber drying kiln, that is, it retards surface drying and thus tends to eliminate any tendency toward casehardening or checking. Moisture may be introduced by steam jets. In some of the more elaborate systems this feature is under automatic control. Better results are secured when some attention is given to the humidity of the air. With a dry bulb reading of 115° to 120°, a satisfactory wet bulb temperature would be 95°.

Eliminates all Guessing

When the conditions in the kiln are subject to control and are maintained constant, it is an easy matter to watch the material. It will, probably, be found that three-ply will dry down to a low moisture content, say 6 percent, in from eight to twelve hours, five-ply may require twenty-four hours, while veneered work having thick cores may need as long as thirty-six hours. In the latter case, in fact with all kinds of material, it is only the glue moisture which must be eliminated for all stock, cores, crossbanding and face material should and must be thoroughly dry before laying. This may be taken as one of the first rules for success in the veneering operation.

It is most desirable that the drying be under close control the same as any other operation.

Matches Require Much Lumber

It is estimated that about 85,000,000,000 board feet of lumber are used each year for matches and toothpicks, the major part of which is for matches. Of this amount about 86 per cent is white pine and 7 per cent basswood, of which the matches are made. Toothpicks are made almost exclusively of beech, birch and maple.

When you increase the width of a band saw and use it for ripping purposes it is as well to increase the distance between the points of the teeth.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.

Buyers of Veneers and Panels

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in this publication. They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend his time and money to get in touch with you. He deserves it—if his stock and prices are right.

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time

(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

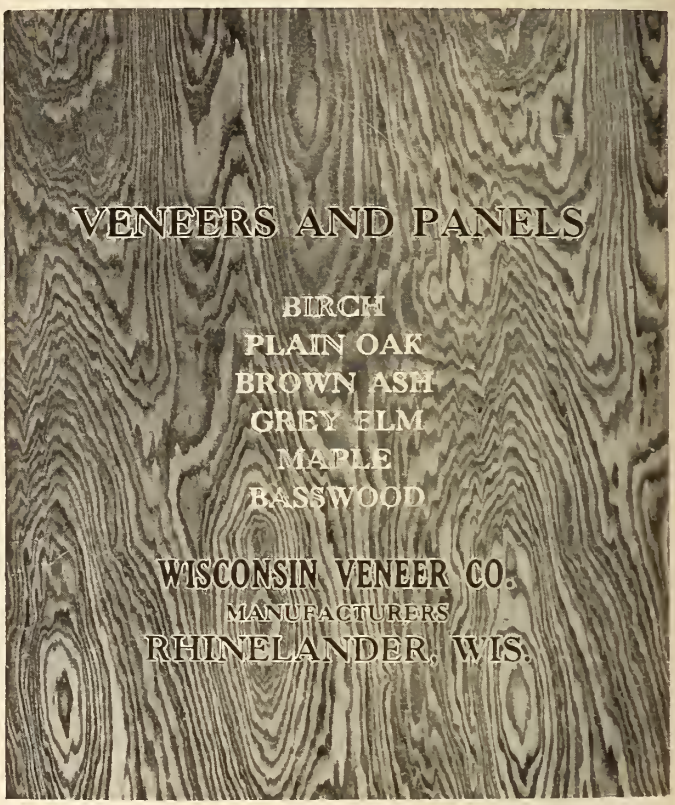
Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.



Litton Veneer Co.

Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill

ROCKFORD - ILLINOIS

J. W. Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers

Oak Lumber and Veneers

Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Poplarand Walnut Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND.

HOFFMAN BROS. CO.

ESTABLISHED 1867 - INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car 1/20'	Red Oak (log run)
½	Car 1/16'	Red Oak (log run)
½	Car 1/20'	White Oak (log run)
½	Car 1/16'	White Oak (log run)
1	Car 1/28'	Walnut (half round)
25M	1/28'	Poplar Crossbanding
5	Cars 1/8'	Poplar (log run)
2	Cars 1/8'	**Poplar (corestock)**

Prices by wire on receipt of your inquiry

HB

Reg U S Pat Off

FORT WAYNE, IND.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

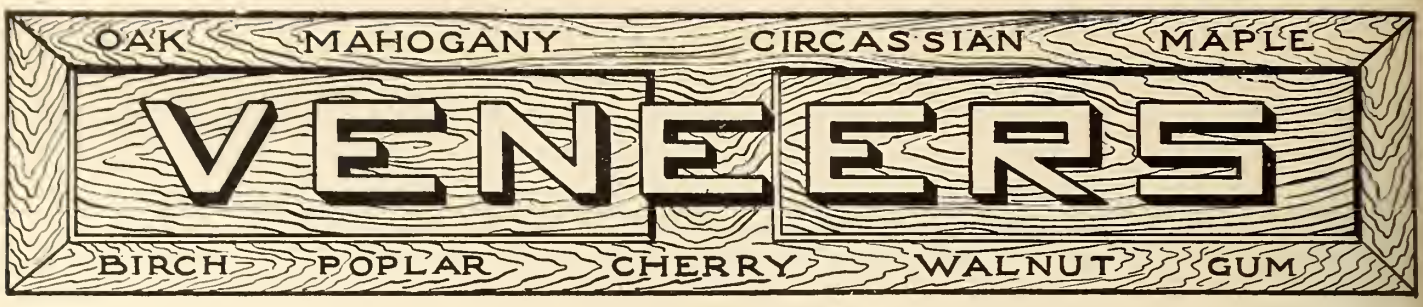
The Standard Veneer Co.
Portland, Maine

Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

May we know your requirements early?

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

New and Used Woodworking Machinery

We Can Save You Money—Look over our partial list and if you do not see your requirements—Write, wire or phone us.

60″ Three Drum Sander Berlin.
42″ Three Drum Sander Berlin.
12″ 4-Side Goldie McCullough Moulder.
7″ 3-Side Cowan & Co. Moulder.
24″ Major Harper Poney Planer.
24″ Major Harper Poney Planer.
10″ Universal Woodworker McGregor Gourlay.
24″ Power Feed Jointer Preston.
C. M. C. Dowelling Machine ⅝, ¾ & 1″ Heads.
36″ Preston Band Saw.
No. 125 Preston Trim & Rip Saw.
1—8′-0″ Mattison Belt Sander.
Roller Top Saw Tables Wood Frame.
Belt Sanders.
24″ Disc & Bob Sander.
6′ Linderman Dovetailer & Glue Jointer.
42″ Jackson Cochrane Band Rip Saw.
38″ American Veneer Presses.
Chapman Ball Bearing Elevating Floor Truck.
Exhaust Fans.
30″ x 12″ McGregor Gourley Double Surfacer.
Power Feed Rip Saw.
Combination Lath Machine, Green.
Motors & Transmission.

GENERAL MACHINERY Company
67-69 Frederick St., TORONTO
TELEPHONE MAIN 2200

African Mahogany

JUST ARRIVED

Choice shipment showing good percentage of Roey Figure. F. A. S. quality, firm texture.

West African Mahogany

This is the first direct shipment we have been able to receive since pre-war days.

Our supply is limited, don't miss some of it.

Phone, Adelaide 148

The Gall Lumber Co., Ltd.
Offices, Dry Kilns & Sorting Yards — Toronto

The good wood worker can't work wood well, unless he would work 'r good wood!

Well?

Canadian General Lumber Company, Limited
712 Bank of Hamilton Bldg.
TORONTO
MONTREAL OFFICE: 203 McGill Bldg.

Selling
Graves, Bigwood & Co.'s
Lumber, Lath and Box Shooks

News of the Trade

The Guaranteed Upholstering Works, Montreal, were recently registered.

Wall Bros., paint and varnish manufacturers, have been registered in Montreal.

The Calgary School Board, Calgary, Alta., are in the market for seating for 160 pupils.

The factory of the Redpath Cabinet Co., Yonge St., Toronto, was recently damaged by fire. Loss $1500.

Hart & Lefebvre, Limited, Montreal, dealers in plywood veneers and glues, recently suffered a loss by fire.

The Grier Timber Co., 342 William St., Montreal, have commenced work on a small woodworking factory.

Geo. Wedlake, Mayor of Brantford, Ont., and president of the Cockshutt Plow Co., passed away recently at Brantford.

The Chesley Chair Co., Limited, Chesley, Ont., are marketing a line of red cedar chests known as "Chesley Cedar Chests."

The eighth annual convention of the Millwork Cost Bureau will be held in the Congress Hotel, Chicago, April 19th and 20th.

J. P. McQuillen, St. Johns, P. Q., who conducted a wood turning factory for many years, passed away recently at the age of 78 years.

The carriage shop of Joseph Taillefer, Versailles St., Montreal, was recently damaged by fire, a number of new automobile bodies being destroyed.

The Andrew Malcolm Furniture Co., Limited, Listowel, Ont., contemplate installing a National dry kiln and increasing their lumber storage facilities.

The Victoriaville Furniture Limited, Victoriaville, P. Q., have opened display rooms at 366 St. Catherine St. East, Montreal with N. J. Cote in charge.

The contract for millwork for the Church of the Resurrection, corner Milverton & Woodbine Aves., Toronto, has been awarded to T. H. Hancock, Limited.

J. R. Eaton & Sons, Limited, Orillia, Ont., have been awarded a contract for millwork for the Muskoka Free Hospital which is being erected at Gravenhurst, Ont.

The Anglo-American Auto Co., 41 Scott St., Toronto, expect to call for tenders shortly for the $500,000 automobile factory they contemplate erecting at Trenton, Ont.

The planing mill and flour and grist mills of Pyatt & Hart, Picton, Ont., were recently destroyed by fire. The loss is estimated to be $20,000, partly covered by insurance.

The Canadian Automobile Corporation, 197 Sparks St., Ottawa, have commenced work on the $50,000 automobile factory which they are building just outside of Hull, P. Q.

The sash and door factory which Latour & Dupuis, Inc., are erecting at St. Johns, P. Q., is rapidly nearing completion. This plant will cost in the neighborhood of $25,000.

Radford-Wright-Wilson Co., Limited, Winnipeg, Man., have been awarded a contract to the value of $21,858 for a school desks. This order was placed by the Winnipeg School Board.

Kent-McClain, Limited, Toronto, manufacturers of showcases and store fixtures, have been awarded a contract for the the fixtures for the new store of the Jaeger Co., Limited, 32 King St. West, Toronto.

O. G. Scheifele, of the Star Construction Co., 90 N. Cameron St., Kitchener, Ont., wants quotations on a carload of chestnut trim Georgia pine and oak flooring. Tenders closed about March 30th.

The contract for wood frame and sash for the new "Mount Royal Hotel" Montreal, which is being erected at a cost of $8,000,000, has been awarded to Travery, Limited, 100B Papincau Ave., Montreal.

The Bruce Woodworkers, Limited, Chesley, Ont., have commenced manufacturing a line of beech and maple flooring. This is in addition to the table slides, table rims and pins which were recently placed on the market.

The Victoriaville Furniture, Limited, Victoriaville, P. Q., are now making a line of solid walnut furniture. This is being trade-marked and sold under a guarantee to the effect that sold walnut only is used in all exposed parts.

Commercial Cars of Canada, Limited, Toronto, were incorporated recently with a capital of $120,000, to manufacture and market trucks and lorries. E. Hallman and H. J. Stuart, both of Toronto, are two of the incorporators.

Howard G. Bartling, for many years sales manager of the Paasche Air Brush Co., Chicago, has resigned this position to become vice-president and general sales-manager of the Peerless Pneumatic System, Inc., Chicago.

The A. R. Williams Machinery Co., Limited, 64-66 Front St. West, Toronto, have taken over the agency for the J. A. Fay & Egan Co., of Cincinnati, and will represent the "Lightning Line" of woodworking equipment in Canada.

Tenders are being called for the superstructure of the Boon Ave., Baptist Church, Boon Ave., Toronto. A. C. Smither, 121 Greenlaw Ave., is the architect. No doubt seating and other church fitments will be required.

The International Tank & Silo Co., Limited, Toronto, have been incorporated to manufacture and deal in articles of wood, specializing in tanks and silos. Capital $40,000. A. B. Mortimer, Toronto, barrister, is among the incorporators.

The contract for tables for Walkerville's new continuation school, has been awarded to the Williamson Construction Co. of Walkerville, whose bid of $1799 was the lowest received. The contract calls for 32 tables of oak construction.

The American Purchasing Corporation, C.P.R. Building, Toronto, are supplying the furniture and furnishings for the New Prince Edward Hotel, at Windsor, Ont. It is understood that these items will cost in the neighborhood of $60,000.

John Howes & Son, Limited, Harriston, Ont., have been granted a provincial charter to manufacture and deal in lumber and wood products of all kinds; capital $40,000. John Howes and N. J. Howes, both of Harriston, are among the incorporators.

The Dryno Cabinet Co., Limited, Toronto, have been granted a provincial charter to manufacture kitchen cabinets and other household equipment. Capital $40,000. B. C. Seale and C. M. Peterson, both of Toronto, are two of the incorporators.

The Compo Company, Limited, Lachine, Que., have been incorporated to manufacture and deal in gramaphones, and other musical instruments. Capital $100,000. Among the incorporators are J. S. Lovell and C. D. Magee, both of Toronto, Ont.

Heywood-Wakefield Co., of Canada, Limited, Orillia, Ont., have been granted a federal charter to manufacture and market chairs and all kinds of furniture. Capital $50,000. A. J. Lloyd and W. A. Buchanan, both of Orillia, are two of the incorporators.

The contract for the chairs for the new Canadian Parliament Buildings, which is being handled by the Owen Sound Chair Co., Owen Sound, Ont., is nearing completion.

It is a fact that, with few exceptions, all manufacturers realize the value of time. Some kind of a system is invariably used in an endeavor to keep account of the hours of purchased and productive labor.

Some systems are good, others, although they are still used to a certain extent, have been proven time and time again to be inefficient and altogether inadequate to keep step with industry's progress You owe it to yourself and to your business to see that the system which is in use in your plant is at all time dependable.

International Time Recorders are absolutely dependable by reason of the fact that the time records they produce are mechanically accurate, legible and unchangeable.

International Job Recorders afford absolute assurance that the job time records are made at the time of starting and finishing of any job. Without this assurance cost figures cannot be accurately established.

International Time Recorders tell you exactly the amount of labor hours you have purchased. International Job Recorders tell you the amount of purchased labor hours which have been turned into productive hours; the combination of the two enabling you to reduce your non-productive hours to a minimum.

Time Recorder prices are back to bed-rock. Reductions ranging from $10 to $85 according to style and type of instrument. Now is the time to install this system. Will you let us demonstrate its many advantages.

International Business Machines Co.

LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 29 Dock St. QUEBEC, 506 Merger Bldg MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 16 Gould St HAMILTON, Room 8, 36 James St. S. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd. WINNIPEG, 227 McDermott Ave. VANCOUVER, 230 Cambie St. SASKATOON, 254 Third Ave. S.

Also manufacturers of International Dayton Scales and International Electric Tabulators

Two carloads of chairs have been completed and are being shipped to Ottawa.

Rudd Brush & Lettering Co., Limited, Hamilton, Ont., were recently incorporated to manufacture and deal in brushes, brooms and other wooden products. Capital $40,000. Two of the incorporators are C. E. Ludd and C. S. Alyea, both of Hamilton.

Dean's Sunnyside Pleasure Boats, Limited, Toronto, have been granted provincial incorporation to manufacture and deal in boats, flying machines and other wooden craft with a capital of $300,000. J. Gilbert Dean and E. M. Dean are two of the incorporators.

Martin Motors, Limited, Montreal, were recently incorporated to manufacture and deal in trucks, flying machines, boats and other wooden conveyances. Capital $50,000. J. W. Cook, K. C., and A. A. Magee, both of Montreal are two of the incorporators.

W. S. Sugden, Vancouver, B. C., sent a unique wedding gift to Princess Mary. This consisted of a series of carved wooden panels, depicting pioneer and present-day life in Western Canada. Mr. Sugden is a disabled war veteran and is noted for his wood carving.

Jewett Phonograph Co., of Canada Ltd., Windsor, Ont., was recently granted a federal charter to manufacture and deal in phonographs, records and other accessories. Capital $950,000. Two of the incorporators are E. H. Jewett and J. M. Seymour, both of Detroit, Mich.

The Sheppard and Gill Lumber Co., Limited, Toronto, have been incorporated to take over the business of Sheppard & Gill Lumber Co., and to conduct a general lumber and wood manufacturing business, dealing in sash, doors and all kinds of mill work. Capital $150,000.

The Merritt Engineering & Sales Co., Lockport, N. Y., have issued an attractive pocket catalogue, showing part of their line of veneer and panel making equipment. Among the machines described are found; lathes, clippers, re-drying equipment, knife grinders and other machines.

Algoma Lumber Co., Limited, Wiarton, Ont., have been incorporated with a capital of $50,000 to manufacture and deal in sash and doors, portable houses and other wooden structures. Two of the incorporators are E. W. Geddes of Blyth, Ont., and J. J. Tyson of Wiarton, Ont.

Trenton Hardwood Flooring, Ltd., Trenton, Ont., were recently incorporated with federal charter to manufacture and deal in hardwood flooring and other wood products. Capital $49,000. Two of the incorporators are R. A. Allen, Millbridge, Ont., and J. B. Morgan, Trenton, Ont.

Durant Motors of Canada, Limited, Leaside, Ont., are planning an addition to their present plant. The new building will be three storeys, 80 ft. by 600 ft. When this extension is completed, which will be sometime this fall, the output of the plant will be increased to fifty cars a day.

An announcement was recently made covering the incorporation of the Heywood-Wakefield, Limited, Orillia, Ont., successors to the Lloyd Mfg. Co. This new company has taken over all the interests of the Lloyd Mfg. Co., manufacturers of the Lloyd loom woven line of wicker products.

Daniel Knechtel, veteran furniture manufacturer of Hanover, Ont., has offered to purchase the J. S. Knechtel residence in that town and present it to the municipality for a hospital. Mr. Knechtel also offers to donate $5000 toward equipping the building. It is probable that this offer will be accepted.

The North American Furniture Co., Limited, Owen Sound, Ont., contemplate throwing open their new showrooms to the public and thus giving the citizens of Owen Sound an opportunity of examining the high-class furniture produced by this company and its associate, the Owen Sound Chair Co.

Wm. J. Markle, who for several years was with the Boake Mfg. Co., Toronto, has been appointed manager of the lumber yard and planing mill of the Consumers' Lumber Co., Hamilton. He succeeds M. B. Zimmerman, who resigned to organize the Norwood Lumber Co., Hamilton, which recently entered the wholesale and retail lumber field.

The Canadian Brill Company, subsidiary to the J. G. Brill Company, Philadelphia, Pa., who took over the Preston Car and Coach Co., Preston, Ont., are now working at capacity, engaging 250 employees. They have recently delivered cars to the cities of Toronto, Winnipeg, Victoria, B. C., and conductors' cabooses to T. & N. O. Railway Commission.

J. W. Stone Boat Manufacturing Co., Kenora, Ont., are experiencing considerable demand for their product. They have constructed a large number of skiffs and launches. Recently the company commenced the construction of a large boat for the department of Indian affairs. The contract was secured in competition with the large eastern boat builders.

J. A. Minchner, manager of the North American Furniture Co., Owen Sound, Ont., returned recently from a visit to Grand Rapids, Mich. He stated that while conditions in the Canadian furniture industry were far from ideal they were better on the whole than on the other side. Mr. Minchner is hopeful of considerable improvement in the next month or so.

George Rathbone, Limited, Toronto; Watt Milling & Feed Co., Limited, Toronto; Haley & Son, Limited, St. Stephen, N. B., and S. Anglin & Co., Kingston, Ont., recently joined the Millwork Cost Bureau, of Chicago, as a direct result of the meeting of woodworkers held in Toronto recently, a report of which was published in the February "Canadian Woodworker."

J. B. Torphy, Boston, Mass., is covering the Canadian field in the interests of Richey, Halsted & Quich Co., Cincinnati, who handle a high grade line of Southern hardwoods. Mr. Torphy is steeped in lumber lore having been connected with this industry for the last fifteen years. Before making his present connection he was with Wistar, Underhill and Nixon of Philadelphia, Pa.

An item in the February "Canadian Woodworker" concases and store fixtures, have been awarded a contract for tained the information that the contract for doors for the new Prince Edward Hotel, Windsor, Ont., had been awarded to the McLean Lumber Co. of Windsor. This is not correct. W. J. McKee, of Windsor, Ont., was the successful tenderer and has since delivered the full complement of doors.

Meyers Lumber & Mfg. Co., Limited, was recently organized to manufacture and deal in wood products of all kinds and to carry on a retail lumber business. They are erecting a plant in North Toronto and are in the market for considerable equipment. A temporary office has been secured at 15 Toronto St., Toronto. W. Warren, who for the last few years has been in charge of the West Toronto Branch of the R. Laidlaw Lumber Co., is managing director of this new concern.

The number of schools, including high and technical schools, which are going up in different parts of Canada, should create a good market for wood products of various kinds. Not only is a high class of woodwork required for these bulidings, but school furniture of various types must be purchased as well as special forms of woodwork. Recent reports intimate that plans are being prepared for a high school for Scarboro Township, Ont., to cost $125,000, and one for Athens, Ont., to cost $50,000.

James Roberts, Wilton Court Hotel, Toronto, has been appointed permanent Canadian representative for the Mat-

Look for the brand—It's on every board

THE KRAETZER-CURED LUMBER CO.

Your Protection—Our Guarantee

Kraetzer Curing—What It Is

Kraetzer Curing is simply the modern and more efficient application of the treatment of wood relied upon by the artisans of the earlier periods in the construction of their master pieces of cabinet work. Even, now, after the elapse of centuries, we still frequently encounter such pieces in a perfect state of perservation.

This treatment is even more beneficial to Gumwood than to the woods employed in those earlier times. Kraetzer Curing immediately eliminates the sap and gelatinous substance in the wood. It also completely does away with fermentation and the resulting strain and decomposition, which by some is considered a necessary and deterring evil.

Likewise, Kraetzer Curing makes the sap portion of the wood more dependable than the Heart or Red Wood. It can then be used for practically all purposes with equal or greater satisfaction than Red (or Heart) Gum, Birch, Maple or other woods. It is available at materially lower prices.

Send for the Kraetzer-Cured Booklet, and write or wire for quotations.

The Kraetzer-Cured Lumber Co.

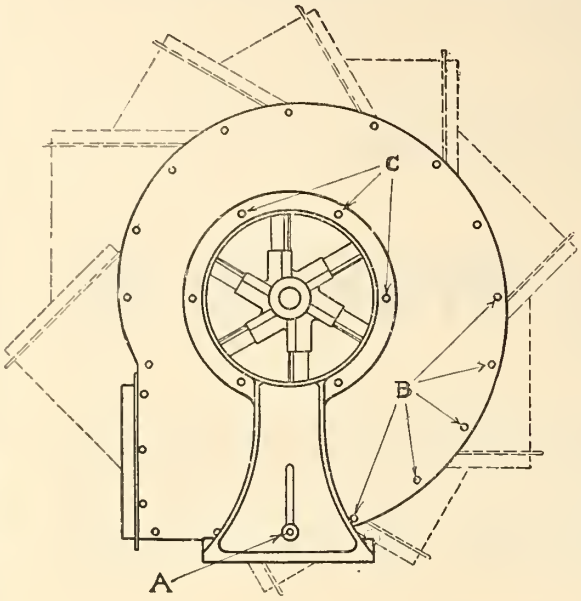
GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

Our Quartered and Plain Red and White Oak, Ask, Hickory, Red Gum and Tupelo is as fine as the highest quality of virgin timber and thorough knowledge of production can produce.

THERE IS NONE BETTER

Canadian Mill Exhausters



One of the features of the Canadian Planing Mill Exhauster is the reversible housing. It is easily adjustable to either hand and to any discharge.

By this arrangement one fan may be used to meet all requirements, thus eliminating crossed belts and sharp angles.

Let our engineering department help you plan your refuse exhauster system.

Write for catalogue 400-13.

Canadian Blower & Forge Co.
KITCHENER, ONT.

tison Machine Works, Rockford, Ill., Baxter D. Whitney & Son, Inc., Winchendon, Mass., and the Jenkins Machine Co., Sheboygan, Wis. Mr. Roberts has covered the Canadian field on several occasions and looks forward to renewing old acquaintances and making new ones. He is one of the most widely known machinery salesmen on the road to-day, having sold woodworking equipment in various parts of the United States, in Canada, Europe and Australia.

The Annapolis Hardwood Co., Limited, was organized in 1920 and is now conducting a flourishing industry at Annapolis Royal, N. S. Applewood specially processed for handsaw handles, was the first production. The firm also began selling hardwood lumber across the border and this led it into another venture, that of making hardwood flooring. Up-to-date dry kilns of the humidity type and modern machines were installed. During the first year of operation over a million and a half feet of lumber were consumed, while this year it is expected that the two million mark will be reached.

According to a recent despatch, W. E. Phillips, Limited, Oshawa, Ont., a newly organized company, have secured an option on the plant of the Thornton Rubber Co., of Oshawa. It is understood that as soon as the necessary transfer papers are filed, the new organization will commence rebuilding and refitting the plant for the purpose of manufacturing woodwork, mouldings, mirrors, etc. If present plans go through, this plant will be operating by May 1st. To start, employment will be given to about 50 men but it is anticipated that this will be rapidly increased to from 150 to 200. Col. W. E. Phillips, D.S.O., M.C., formerly of Kingston, is in charge of the new company, and R. S. McLaughlin, of McLaughlin Motors, is one of the directors.

According to figures recently issued by the Department of Labor, Ottawa, wages in the woodworking industry did not change very much during 1920; in fact the average is about the same, some lines showing a slight increase while other classes of work have dropped a little. In the sash and door industry the average hourly wage for bench hands during 1920 was 55 cents, while for 1921 the hourly rate was 54 cents. 1920, 44 cents, 1921, 44 cents. In the furniture field rip sawyers were paid an average of 46 cents an hour; in 1920, and 43 cents an hour in 1921. Wood turners received 48 cents an hour in 1920 and 48 cents an hour in 1921. Cabinet makers show a slight increase of 42 cents for 1920 and 44 cents for 1921; benchmen 44 cents for 1920 and 39 cents for 1921.

English Oak Extremely Durable

The durability of English oak is the greatest of any known forest timber, discoveries having been made that it is preserved almost as well under water through centuries as it is when shielded by roofs in ancient castles.

Prof. Burnett, of London, possesses a piece of English oak from King John's palace at Eltham, perfectly sound and strong, which can be traced back for more than 500 years. The oaken shrine of Edward the Confessor is more than 800 years old. One of the oaken coronation chairs in Westminster Abbey has been there for more than five centuries.

In Gloucester cathedral there are 31 stalls of rich tabernacle work executed in oak in the reign of Edward III, and beautifully perfect. When the foundations of the old Savoy palace in London, built 700 years previously, were torn down, the piles, many of which were of oak, were found to be in a state of perfect soundness. A vessel, found in the River Rother in Kent, said to date back to the time of King Alfred, was found to be sound, despite the fact that its oaken keel had been buried in the mud. An oak boat was also found near Brigg in an almost perfect condition, despite the fact that it was nearly 200 years old.

QUALITY SERVICE

In Canadian Hardwoods our aim is to supply you just exactly what you want and at the time you want it.

Any kind, any thickness, any grade

The Kinnon Lumber Co., Limited

454 King Street — — Toronto

NARROW BAND SAWS AND MACHINES FOR THEIR CARE

Our narrow band saws are made of the best Swedish steel and sharpened on the "Grip Feed" Filing Machine the latter of the most advanced design and construction. We specialize in these two items alone, with many years' experience back of us as our qualification to furnish as good a narrow band saw as there is on the market, together with the latest development in a saw-filing machine for the care of band saws.

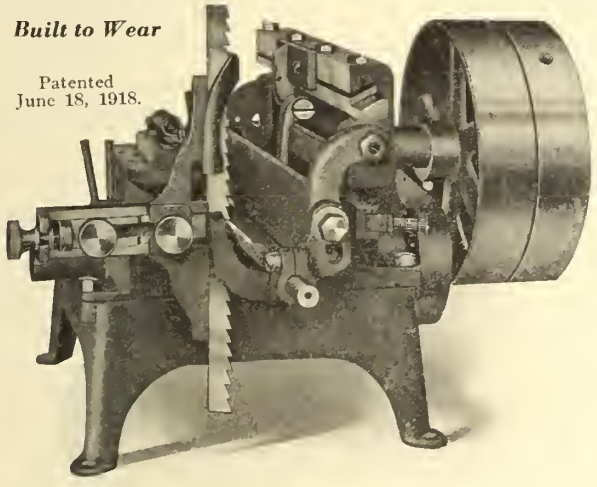
Send us your next order for narrow bands, also ask for particulars of the "Grip Feed" Filing Machine.

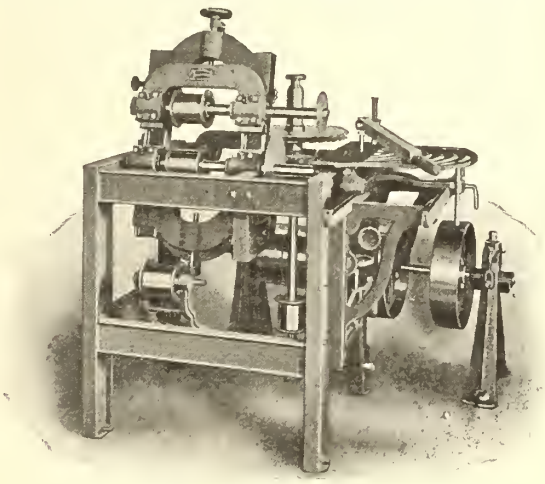
American Saw Filing Machine Co.

36 Washington St., N. Boston 14, Mass.

Built to Wear

Patented June 18, 1918.





No. 19 Saw Tenoner
No. 20 Large Saw Tenoner

Fitted with five saws, has replaced cutter head machines; for all jointing and halving in wood shops and for automobile and carriage wood-work it is the best machine on the market.

Much door, window, sash, furniture and cabinet work is done with this machine where a nice, smooth tenon is required. It is also used for the halving and jointing of stock at any angle.

Tenoners equipped with flexible coupling for direct motor drive or for countershaft.

No. 19 Small Saw Tenoner
No. 20 Large Saw Tenoner
No. 21 Regular Bevel Saw
No. 22 Large Bevel Saw
No. 23 8½" Irregular Dresser
No. 24 6" Irregular Dresser

We also manufacture metal working machines.

Write for catalogue.

Pettingell Machine Co.
Amesbury, Mass.

Mention Canadian Woodworker.

The Peter Hay Knife Co., Ltd.

Manufacture the Best

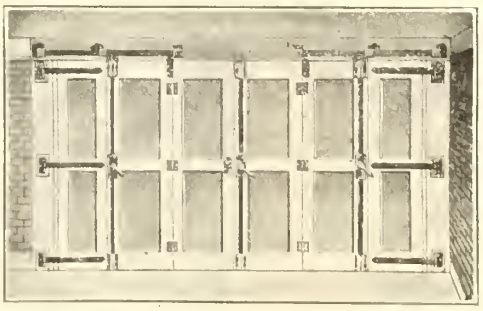
PLANER KNIVES and CUTTERS

OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited

GALT, ONTARIO

Slidetite for Dry Kilns



Richards-Wilcox Canadian Co., Ltd., London, Ont.

This adaptation of "Slidetite" makes a particularly fine door—steam tight—and the free operation will save in time and money. Fit perfectly tight. For openings 16 to 20 feet wide—any height—Doors fold out or in.

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

FOR SALE

One large size Billstrom Clamping Machine
One Mattison Turning Machine with equipment
One Moore 6′ Power Stroke Panel Sander
One Houston 8 x 4-4 sided moulder, complete
One Belt Power Driven Veneer Press 36 x 54″
One Fay Egan Chain Feed Rip Saw (Lightning)
Various sizes three drum Royal Invincible Sanders.

These Machines are all guaranteed in first class condition. **Victor J. Reed Esq.,** Jamestown, New York. 2-3

Bargains in Guaranteed Re-Built Machines. Priced to Sell

Dovetailer, Fay & Egan late model, No. 201, 9 spindle, gang.
Knife Grinder, B. T. & B. capacity 42″.
Glue Jointer, Buss Auto., Capacity 6′6″.
Glue Jointer, Linderman 6′ capacity, complete with one Linderman Rip Saw, fine condition, like new.
Motor, 10 H.P. 110 Volts, D. C.
Mortiser, Fay & Egan Horiz. Hollow Chisel.
Mortiser, Jig type, with and without boring attachment.
Moulder, Rogers No. 3, 7″ three sides, outside.
Moulder, American 12″ four side outside.
Nailer, Doig No. 2, 6 track.
Planer & Matcher or Flooring Machine, 9″ x 3″, Fay Lightning.
Pony Planer, 24″ x 6″ Bental & Margedant.
Cabinet Planer, Buss 30″ x 6″.
Double Surfacer, Goodell & Water 26″ x 6″ endless bed, sec. roll, sec. chipbreaker.
Shapers, Double spindle, three in stock.
Sander, Smith 30″, 3 drum, endless bed.
Sanders, Vertical & Horizontal Disc.
Cut-Off Saw, Railway, hand feed.
Cut-Off Saw, Railway automatic.
Saw Bench, Wallace Portable, Complete with 1/2 H.P. General Electric Motor.
Band Saws, 20″ 36″ and 42″.
Band Resaw, American Clement 42″.
Double Circular Saw, Fay & Egan No. 187, revolving arbor.
Tenoner, single end, Houston Make, top and bottom heads & Cutt-off saw attachment.
Everything in the woodworking line.
Get our quotations before buying.

A. A. McLaughlin & Company
24 West Second Street
Cincinnati, Ohio.

A Bargain for Some One

We have for sale a 12″ Four Side Moulder and Matcher, S. A. Woods, recently overhauled and guaranteed to be in first-class running order. Price very reasonable and can be shipped to any point immediately.

C. Alf. Gingras & Fils, Limitee,
2 Sherbrooke, Que.

FOR SALE

Bargains

Planer and Matcher, 24″, Double Surface,
Planer and Matcher, 15″, C. M. C. No. 105,
Box Board Matcher,
30″ Double Surfacer, C. M. C. No. 212,
24″Single Surfacer,
12″ Buzz Planer,
Moulder, 12″, heavy pattern,
Moulder, 6″, three side with Shimer sash and door heads,
Shaper, double spindle,
Borer, single spindle, horizontal,
Band Saw, 34″ wheels,
Power Feed Rip Saw,
Variety Saw,
Sander, 42″, tripple drum, good as new,
Door Clamp,
Nailer, Morgan No. 8, with side arm.

Cowan & Company of Galt Limited
Galt, Canada
3

FOR SALE

Band Resaw, 54″ Berlin with 3-5½″ saws, $1000.00
Box-Board Printer, one-color, Con. & Deng. 19″ x 44″ $400.00
Box-Board Printer, two-color, 19″ x 44″ Hooper Late type, Chain Feed $800.00
Box-Board Squeezer, 40″ x 48″ Mereen-Johnson automatic $700.00
Corrugated Fastener Driver, Doig 2-head $475.00
Equalizer, Berlin No. 229 automatic, Cap. up to 6′ 6″ long $675.00
Lock-Corner Cutter, Morgan No. 8, double end, $600.00
Lock-Corner Setting-Up machine, Morgan No. 2, $400.00
Nailing mcahines, all styles, Morgan & Doig—State your wants.
Sander, double-disk, 48″ Fischer, all iron $235.00.
Screw Driving machines, Reynolds No. 2, $250.00 Each. (2).
Surfacer, single, 24″ x 6″ J. A. Fay & Co. Sectional roll, $350.00
Surfacer, double, 30″ x 7″ Whitney, Sectional roll, $1150.00

Chas. N. Braun Machinery Co.,
2-3 **Fort Wayne, Indiana.**

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Band Resaw, Connell & Dengler, 54 and 60″.
Band Rip Saw, Yates No. 281
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 44 in. heavy type.
Dowel Machine, Hayes
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.
Jointer, Falls Machine Co., undercut 24 in.,
Jointers, 12″, 16″ and 24″
Jointer, Dichl Continuuous Feed
Lathe, Back Knife Clement 40 in.
Moulder, Hermance 8 and 10 in., 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 4″ and 10″, 4 side
Matcher, American No. 229 fast feed hardwood flooring.
Planers, all sizes, single and double
Sander, endless bed 48 in., H. B. Smith.
Sander, Moore Machine Co., belt.
Sanders, Columbia 42″, 48″ and 60″
Saw, mitre, double end Maddox.

Woodworking Machinery Company of Buffalo, 54 Mechanic St., Buffalo, N.Y.
1 T.f.

In the Hardwood Field

Flood conditions are threatening many of the important southern hardwood producing sections. Heavy rains have forced the closing down or severe curtailment of logging operations, and, as most of the mills had only scanty log supplies, manufacture is also being restricted. The Memphis and Valley territory is in immediate danger from floods. Warnings were issued early this week for the principal rivers in Arkansas, and most of the streams in Mississippi and Louisiana were even then out of their banks, with little chance to discharge their surplus waters before the flood waters in the Mississippi itself have abated. Consequently vast lowland sections are covered with water, making the woods more or less entirely unworkable for an indefinite period. In fact, few loggers expect to be able to resume operations on the former scale before thirty to sixty days. The hardwood market in the meanwhile remains quiet, tho demand undeniably is steadily increasing, and the situation is markedly improved over that of two or three weeks ago.

HYDRAULIC VENEER PRESSES
AND
LUMBER ELEVATORS

Write for Explanation of our Most Efficient Veneer Package Handling System

E. B. VAN ATTA & CO., INC.
OLEAN, N. Y.

New York City Office: 50 Church St. Chicago Representative: Fader Machinery Company, 549 Washington Boulevard

"Established 1884"

GUELPH PATENT CASK CO. Ltd.
Scotstown, Que.

QUALITY · *SERVICE*

Our Veneers and Plywood are choice and we are fully equipped to supply the Canadian Trade.

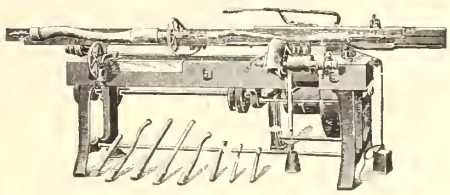
Rotary cut Textile dried

We specialize in 1/4" and 3/16" three ply Birch Panels

Ontario Representative:
Frank Moss P. O. Box 356, **Toronto**

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick, Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.

We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY
Klotz Machine Co.,
Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

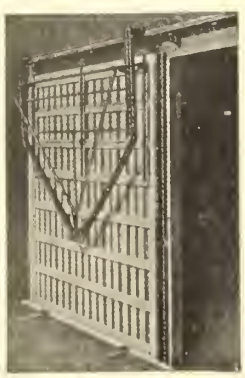
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A.

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

OAKEY'S

Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

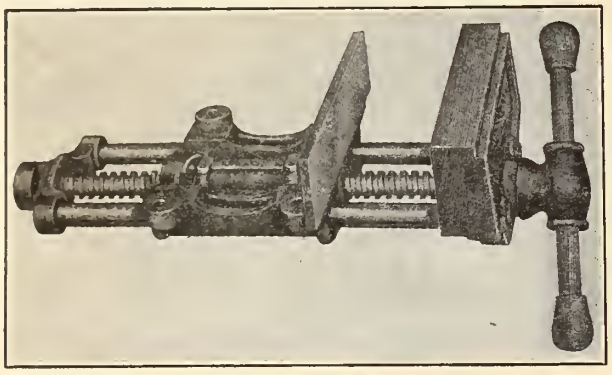
SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

JOHN OAKEY & SONS LTD., WELLINGTON EMERY AND BLACK LEAD MILLS LONDON, S. E. 1.

Canadian Agents:

F. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

The Vise You Swear BY not AT



On the Market for 15 years.

Globe Vise & Truck Co.

GRAND RAPIDS, MICH.

We also manufacture a complete line of steel trucks particularly for wood working factories. The body of our truck is absolutely indestructible, and there are no nails nor screws in the top to mar material, whether finished or unfinished. The roller bearing feature in the wheels allows for much easier handling than the old style plain wheels on the wood truck. In fact one man can handle much more material than on the old style. The price is very little more than that of the old style wood trucks.

"The Phillips Line"

Window Frame Machines

This is the work ☞

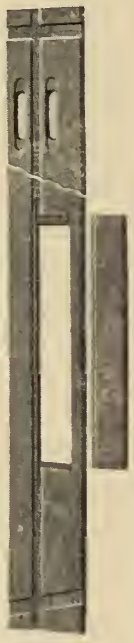
Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.



Atlas Mfg. Co. of Orlando

Orlando, Fla., U. S. A.

Dowels, Turnings, Knobs, Spindles, Buttons, Drawer Stops, Table Pins, Screwhole Plugs. Special Woodwork to order.

No 2 Dowel Pin

HENRY ROWE MFG. COMPANY NEWAYGO, Mich.

BOX NAILS and WIRE for Every Use

We manufacture a complete line of nails and wire in every style and size. Your special needs can be supplied. Write us today. We manufacture special styles to order.

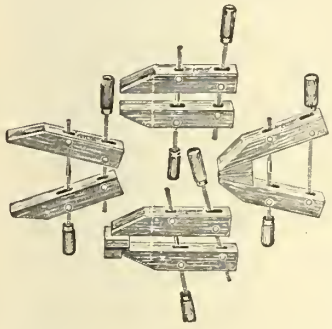
Laidlaw Bale-Tie Co., Ltd.

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.

Head Office and Works: HAMILTON, CANADA

"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.



"Jorgensen"

Peerless Adjustable Hand Clamp

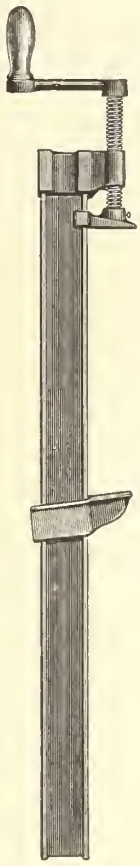
Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

For Sale By

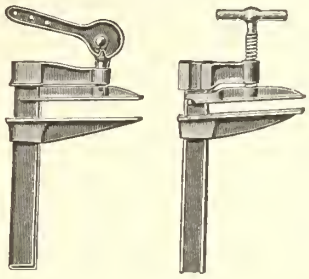
Aikenhead Hardware Limited ..... Toronto
Caverhill Learmont Co. ..... Montreal
Lewis Bros., Limited ..... Montreal



Colt's Clamps

for the

Woodworker



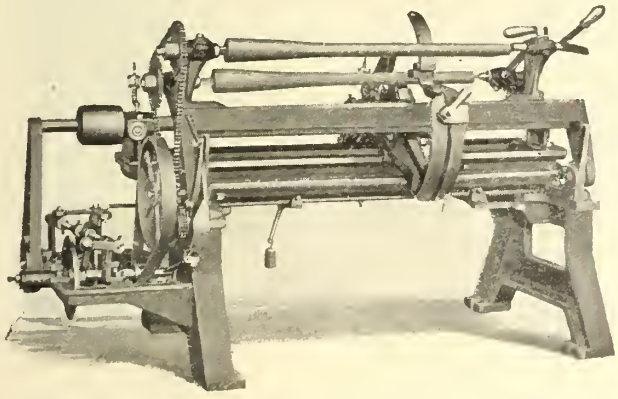
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



Wood Turning Machinery

for making Handles, Spokes, Ball-Bats, Spindles, Table Legs, Chair Legs, Whiffletrees, Neck Yokes, Etc.

ALSO SANDERS, RIP SAWS, CUT OFF SAWS, ETC.

Our machines are
SIMPLE, STRONG, DURABLE

Write for free catalogue No. 31

THE OBER MFG. CO.

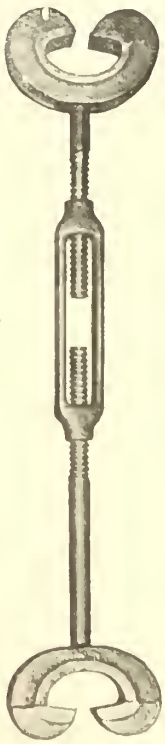
CHAGRIN FALLS. O., U.S.A.

Better work follows the use of the "Empire"

There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

Get in touch with us now. We can make prompt delivery from stock.

We specialize in all types of woodworking tools.



Empire Tool Works

Toronto - Ontario

The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Co., Chicago, Ill.

AROMATIC RED CEDAR
Earthman Lumber Co., Murfreesboro, Tenn.

AUTOMATIC HOLE-CUTTING MACHINE
Virginia Wheel and Hole Sawing Machine Co., Roanoke, Va.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARINGS
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P.B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

B. C. FOREST PRODUCTS
B. C. Lumber Commissioner, Toronto, Ont.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner Mass.
Williams Machinery Co., A. R., Toronto, Ont.

BEVEL & MITRE SAWS
Pettingell Machine Co. Amesbury, Mass.

BLOWERS
Canadian Blower & Forge Co., Kitchener, Ont.

BLOW PIPING
Canadian Blower & Forge Co., Kitchener, Ont.
Neville Cooper Co., Toronto.

BOILERS
Engineering & Machine Works, St. Catharines, Ont.

BORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Son Co., L. G., Gardner, Mass.
Nash, J. M., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Reynolds Machine Co., Massillon, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Valley City Machine, Works, Grand Rapids, Mich.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.
Cary Mfg. Co., Brooklyn, N.Y.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

BUTTONS
Rowe Mfg. Co., Newaygo, Mich.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.

CASTERS
Foster, Merriam Co., Merriden, Conn.
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Shurly-Dietrich, Galt, Ont.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company, Preston, Ont.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

CLAMP CARRIERS
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.

CRATING LUMBER
Lloyd, W. Y., Toronto, Ont.
Colborn, C. B., Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D., Guelph, Ont.

CUT-OFF SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.
Richards-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.
W. S. Hawker Mfg. Co., Dayton, Ohio.

DOWELS
Canada Wood Specialty Co., Ltd., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.

DRIERS (Hot Plate)
Merritt Eng & Sales Co., Lockport, N.Y.

DRIERS (Veneer)
Merritt Eng & Sales Co., Lockport, N.Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont
Grand Rapids Veneer Works, Grand Rapids Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Simonds Canada Saw Co. Montreal, P.Q.

EDGER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Garlock Machinery Ltd., Toronto, Ont.

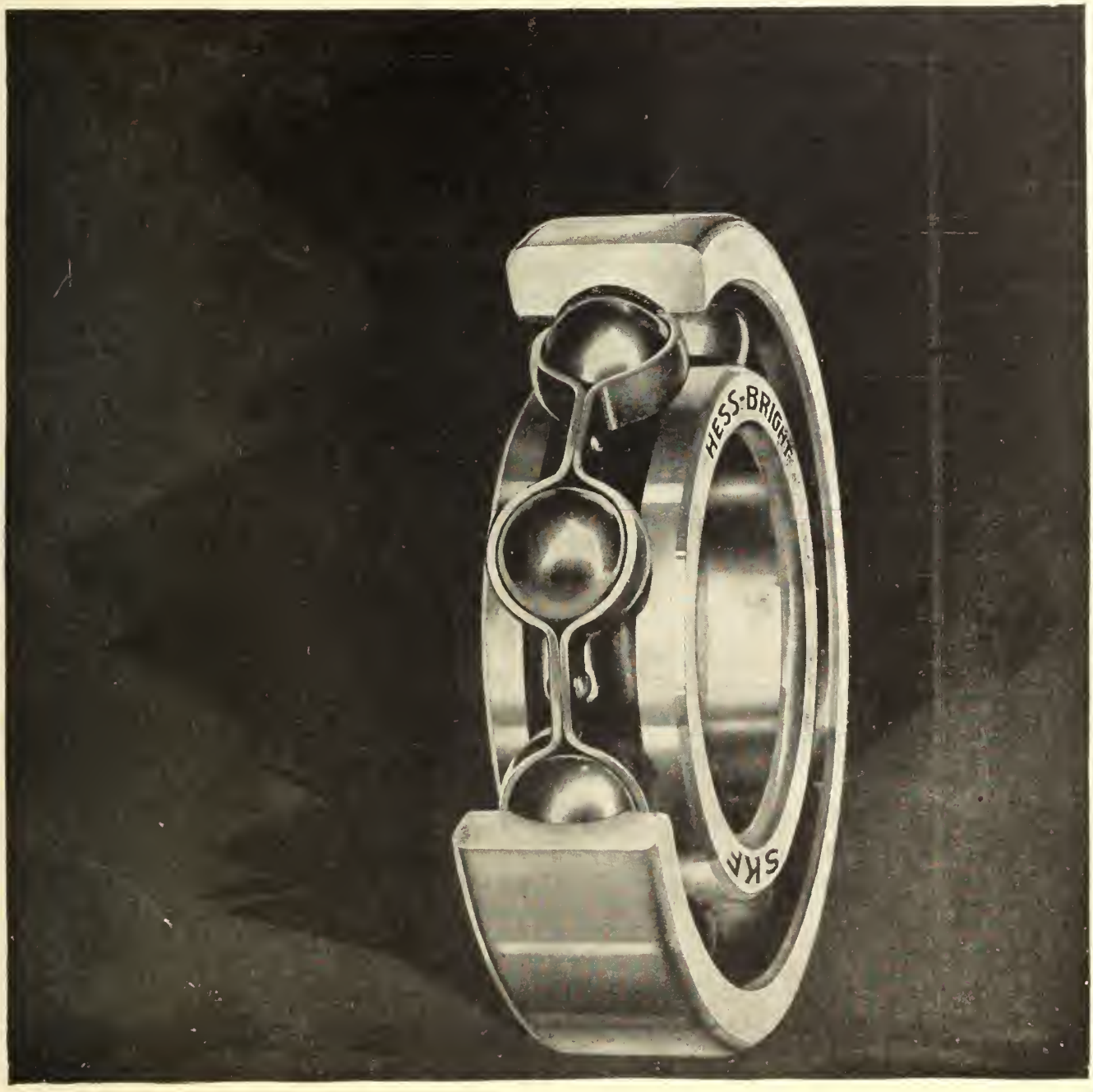
EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.

FEED ROLLS
Atkins & Co., E. C., Hamilton, Ont.

FINISHING PRODUCTS
Campbell Co., M. L., Kansas City, Mo.
Flint Varnish & Color Works, Toronto, Ont.

FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.



The Load You Can't Estimate

NO matter how great is the foresight of the machine designer, he cannot guard against unexpected thrust loads on the bearings caused by conditions beyond his control.

The Deep Groove Bearing can withstand thrust loads greatly in excess of its radial capacity and coming from either direction.

Both the design and quality of this double purpose bearing are endorsed by the mark **SKF** and are backed by the world-wide researches and long experience **SKF** Industries.

This experience is at your disposal and you are urged to submit your bearing problems to us for free and impartial advice.

CANADIAN SKF COMPANY, LIMITED

TORONTO - - MONTREAL

621

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

FASTENERS
Cary Mfg. Co., Brooklyn, N. Y.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GEARS
Hamilton Gear & Machine Co., Toronto, Ont.

GLUE
Coignet Chemical Products Co., New York N.Y.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
Aberdeen Lumber Co., Pittsburg, Pa.
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Rush Lumber Co., Memphis, Tenn.
Thomas & Proetz Lumber Co., St. Louis Mo.
Turner-Farber-Love Lumber Co., Leland, Miss.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.

HARDWOOD DIMENSION STOCKS
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson-Tully Co., Memphis, Tenn.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree Ark.
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Turner-Faber-Love Lumber Co., Leland, Miss.
Dudley Lumber Co. Inc., Memphis, Tenn.
Frye Lumber & Veneer Co., J. W., Dayton, O.
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La
Hafner Manufacturing Co., St. Louis, Mo.
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co. Toronto, Ont.
Kinnon Lumber Co., Ltd., Toronto, Ont.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont
Pickrel Walnut Co., St. Louis, Mo.
Richards Hardwood Co., Memphis, Tenn.
Rush Lumber Co., Memphis, Tenn.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn
Stimson & Co., J. V., Owensboro, Ky.
Tennessee Lumber & Coal Co., Cincinnati Ohio
Thomas & Proetz Lumber Co., St. Louis Mo.
Vail Cooperage Co., Fort Wayne, Ind.
Whiting Co., Wm. S., Johnson City, Tenn.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.
Van Atta & Co., E. B.,, Olean, N. Y.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company. Kitchener. Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie. H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt. Ont.
Oliver Machinery Co., Grand Rapids. Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto. Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto. Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

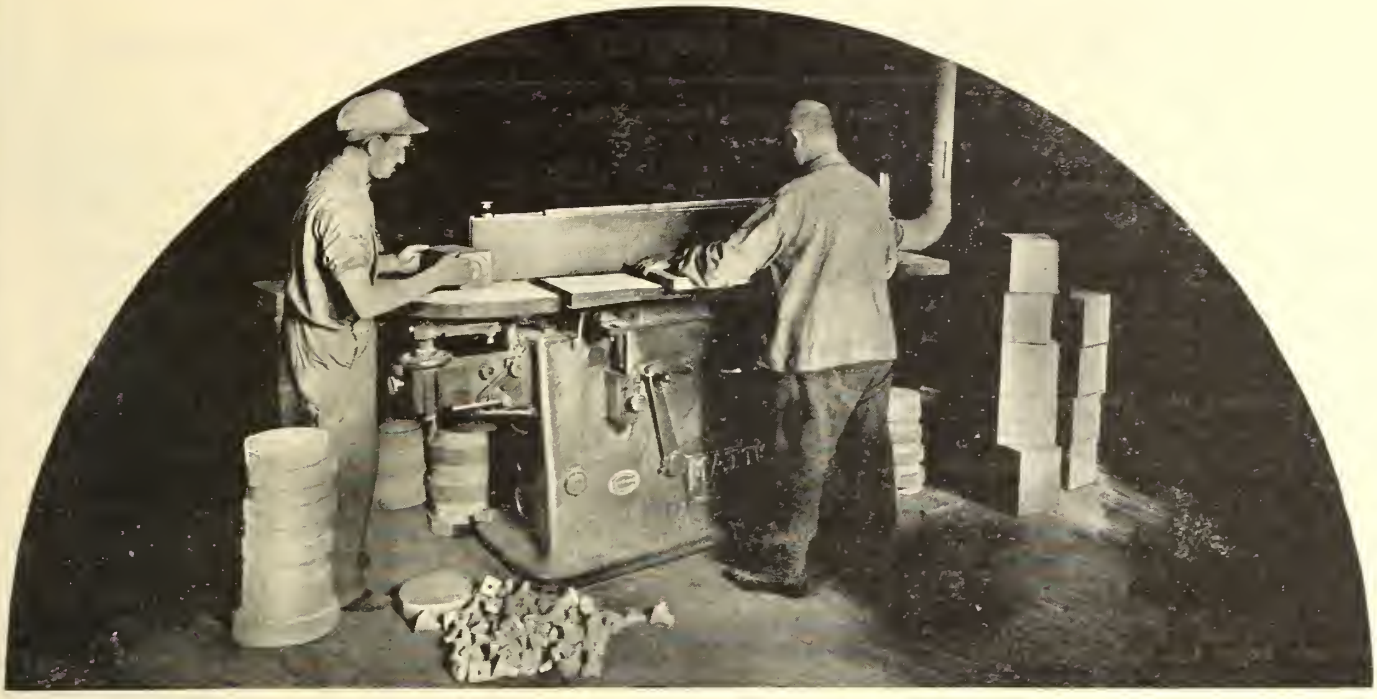
NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.
Yates Machine Co., P.B. Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids. Mich.

PANELS
Algoma Panel Co., Algoma, Wis.
Calhoun Plywood Co., Sheboygan, Wis.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rockford, Ill
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.



A GREAT COMBINATION

THERE is no more direct, certain, way to sanding efficiency in your plant than by having good men working on good machines and using Carborundum Brand Garnet Paper and Cloth.

You are thereby always assured of an increased production, better finished products, a saving of the time of labor and a consequent lessening of sanding costs.

It's a great combination made possible because—

CARBORUNDUM BRAND GARNET PRODUCTS
MAKE GOOD SANDERS BETTER SANDERS

THE CARBORUNDUM COMPANY

NIAGARA FALLS, NEW YORK, U.S.A.

New York, Chicago, Philadelphia, Boston, Detroit, Cleveland, Cincinnati, Pittsburgh, Grand Rapids, Milwaukee.

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Calhoun Plywood Co., Sheboygan, Wis.
Guelph Patent Cask Co. Scotstown, P.Q.
Wisconsin Veneer Co., Rhinelander, Wis.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford. Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co., Herman, Brooklyn, N.Y.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SATINWOOD
Willey Co. C. L. Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P.B. Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D. Guelph, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW TENONERS
Pettingell Machine Co. Amesbury, Mass.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW FILING MACHINERY
American Saw Filing Machine Co. Boston, Mass.

SAW TENONERS
Pettingell Machine Co. Amesburp, Mass.

STEEL DOOR MATS
Cary Mfg. Co. Brooklyn, N. Y.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont

TABLE SLIDES
Bruce Woodworkers Ltd. Chesley, Ont.
Walter & Company, B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.

TRIMMERS
Arbuthnot Lumber Sash & Door Co., Vancouver, B.C.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.
Shantz, P E., Preston, Ont.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.
Walter & Sons, J. Kitchener, Ont.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

Overton Fine Benches

OUR peculiar construction makes every Bench permanently durable. Careful workmanship, dignified designs and a beautiful finish. We can exactly match any standard instrument.

We also specialize in large quantity production of Bench parts, phonograph legs and parts, table and floor lamps, and fine turnings and carvings of every description.

Our fine organization of skilled workmen assures high quality at the lowest prices.

Your own designs promptly and faithfully reproduced. Consult us.

The No. 45 Duplex, Duet Width

S. E. OVERTON COMPANY

South Haven MICH. U.S.A.

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY

17 State Street NEW YORK CITY

NEW and USED

Ironworking — Woodworking

MACHINERY

AND

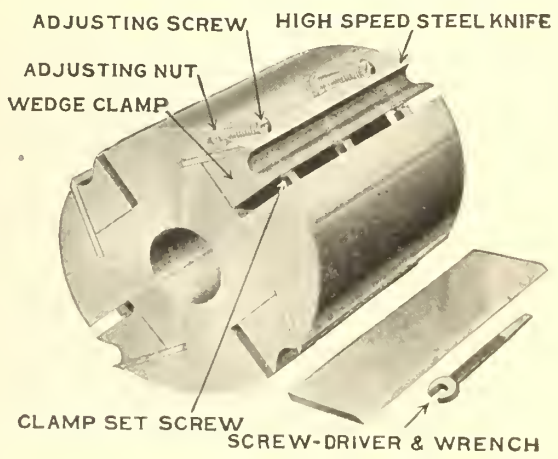
SUPPLIES

ASK FOR OUR NEW STOCK LIST

H. W. Petrie, Limited

131—147 Front Street West

Toronto



The PORTER "C" Slip-on-Head for Shapers, Jointers and Moulders will cut straight or cross grain without tearing. Irregular shaped knives can be used as well.

There are over 3,000 of these Heads in daily use.
Write for circular and quotation.

C. O. Porter Machinery Co.

GRAND RAPIDS, MICHIGAN, U.S.A.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Ault & Wiborg Company, Toronto. Ont.
Flint Varnish & Color Works, Toronto, Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Rohert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Guelph Patent Cask Co. Scotstown, P.Q.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumher Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Northwestern Cooperage & Lumber Co., Glad stone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland Me.
Stimson Veneer & Lumher Co., Memphis, Tenn.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Wisconsin Veneer Co., Rhinelander, Wis.
Wood Mosaic Co., Louisville, Ky.
Willey Co. C. L. Chicago, Ill.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.
Van Atta & Co., E. B.., Olean, N. Y.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumher & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.
Flint Varnish & Color Works, Toronto, Ont.

WOODWORKING MACHINERY
Elliot Machinery Co. Belleville, Ont.
General Machinery Co., Toronto, Ont.
Oher Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids. Mich.
Pettingell Machine Co. Ameshury, Mass.

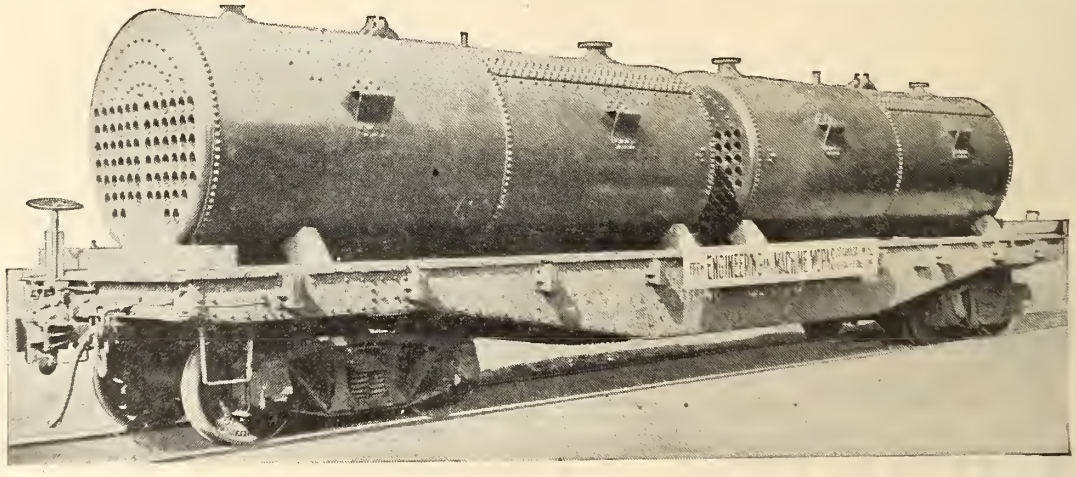
WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Elliott Machinery Co., Belleville, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
Mattison Machine Works, Rockford, Ill.
Oher Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P.B. Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids. Mich.

WOOD LATHES
Oher Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

WIRE BOX STRAPPING
Cary Mfg. Co. Brooklyn, N. Y.



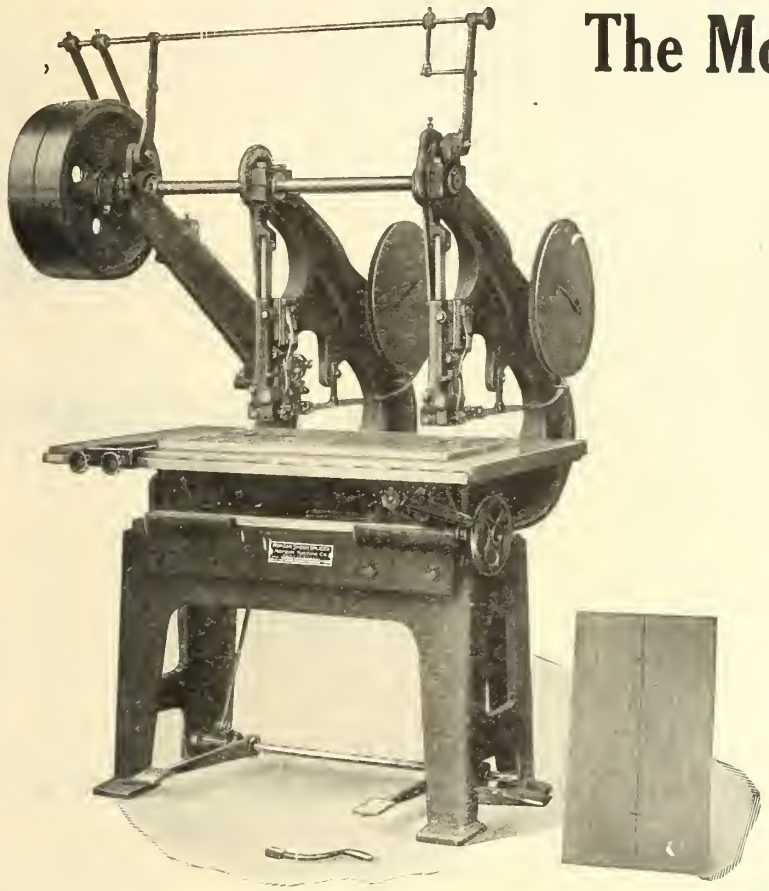
You must have Steam—

The cheapest way to get it is to have us put in new Boilers for you. We are prepared to give exceptional service and prices now on Horizontal Return Tubular Boilers, on which we specialize.

Engineering and Machine Works of Canada, Limited

St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal

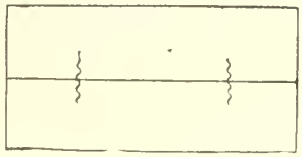


The Morgan Shook Splicer

uses narrow stock

It automatically feeds, cuts and drives corrugated fasteners. Adjustable—handles fasteners from ¼″ to ⅞″ in width and from ¾″ to 1¼″ in length.

Speed, Accuracy, Economy

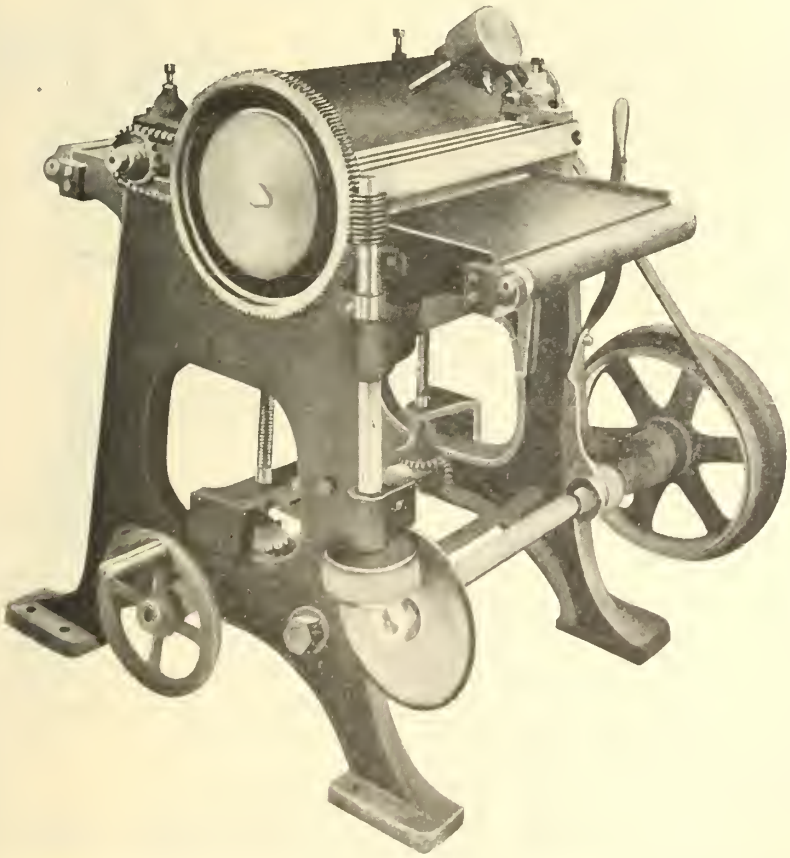


We manufacture Matchers, Printers and Nailing Machines.

WE INVITE YOUR INQUIRY

Morgan Machine Co.

Rochester, N. Y.



The Elliot Bull Dog Planer

6″ x 16″

The facts that the head is run by a worm gear; no pinions on the head and that the feed rolls are driven independent of the head excludes vibration. Hence—it planes smoother than any other Pony Planer made. Also it uses less power.

Write for Prices and Catalogue

Elliot Machinery Co.

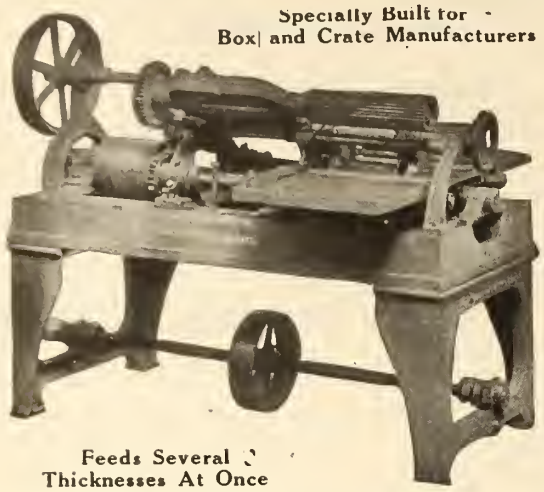
Limited

Belleville, - - - Ontario

CANADA

"The Chattanooga" — Just Another Name For Fast, Economical Gang Ripsawing

Specially Built for Box and Crate Manufacturers



Feeds Several Thicknesses At Once

This latest improved gang ripsaw is powerful, fast, safe and eliminates wastage. For gang sawing boards into strips or head sticks and for ripping veneers it is unsurpassed.

Has powerful feed and securely holds down and feeds short pieces. The feed rolls are automatically adjustable to varying thicknesses. Upper rolls are driven by cut gears, and the lower ones by sprocket chain. Several thicknesses of veneering can be fed thru machine at one time.

The CHATTANOOGA is an unusually big producer, easily operated, and turns to profitable account short stuff lying around a mill—otherwise wasted.

Attractive price. Complete information on request

Chattanooga Machinery Company
Chattanooga, Tenn.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.

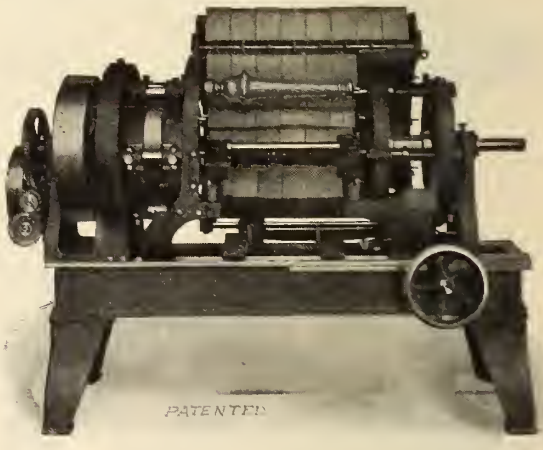
To **Woodworkers and Furniture Manufacturers**

Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

We are always pleased to quote prices and give any information you may desire. Try us on your next order.

THE
Brantford Pattern Works
BRANTFORD

If You Have an Automatic Lathe,
AND IT PAYS



WHY NOT install a Nash Sander to sand your turnings?

Hand sanding is most expensive. You can get a far better result at a much lower cost on the Nash Sander.

Why not ask for details?

J. M. NASH, Milwaukee, Wis.

SIMONDS
Machine Knives

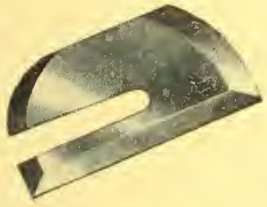
Every Planer, Veneer, Hog Knife or any other of the various kinds of Machine Knives bearing the Simonds Trade Mark is backed by the guarantee of the World's largest makers of Machine Knives. These knives are high grade steel, perfectly ground and balanced. They hold their cutting edge and produce smoother lumber.

Write for catalog and prices.

Simonds Canada Saw Co., Limited

Montreal, Que.

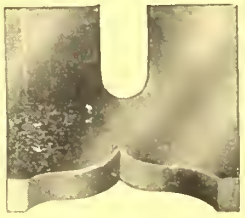
St. John, N. B — Vancouver, B. C.



ATKINS

STERLING QUALITY

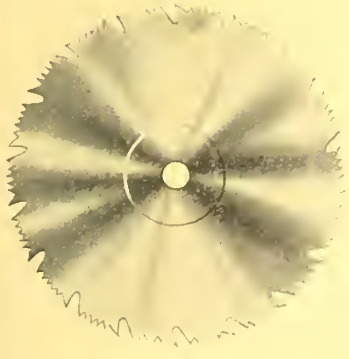
SAWS and KNIVES
ECONOMIZE



ARE your saws and knives wasting your lumber? If so, why not turn that waste into a profit by installing

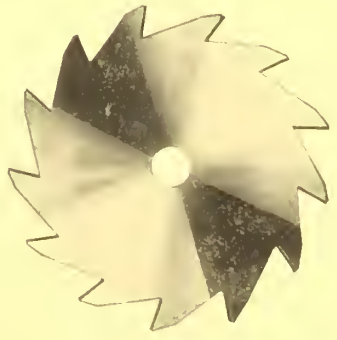
Atkins Sterling Quality Saws

and Machine Knives



some of the largest woodworking mills in the country are using Atkins Saws exclusively, because they increase production, stop waste and make a name for themselves wherever they go.

Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.

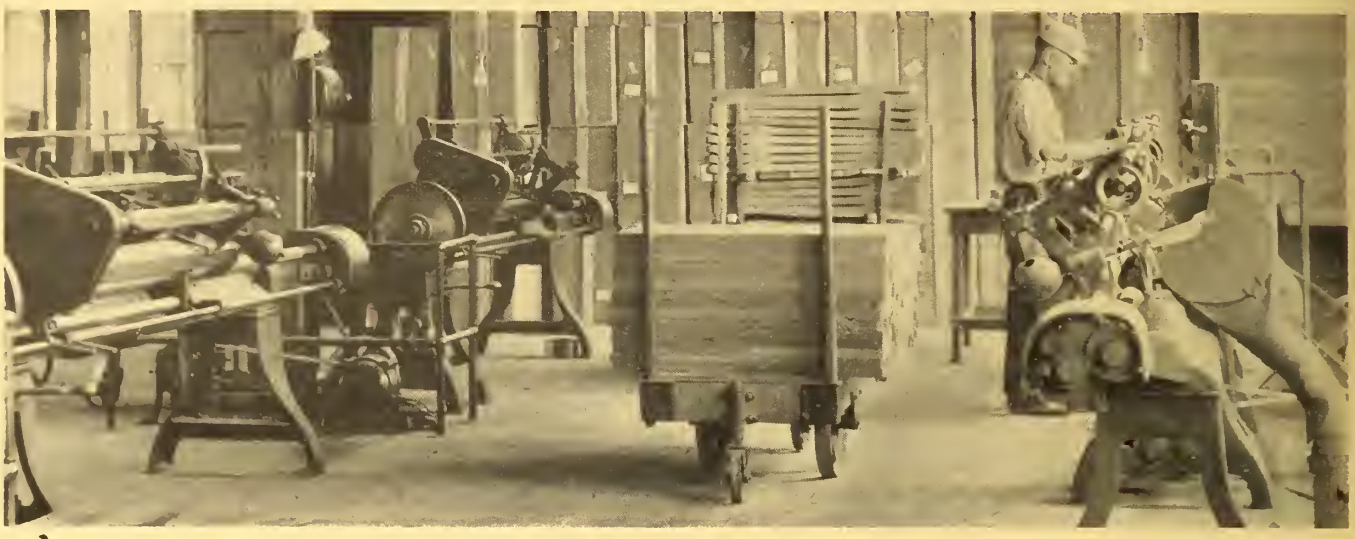


E.C. ATKINS & CO.

Makers of Sterling Saws

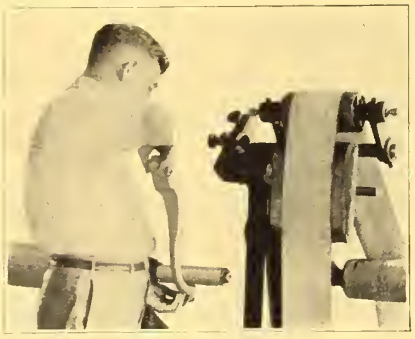
Factory—HAMILTON, Ont. Vancouver Branch—109 Powell Street

One Man Shapes and Finishes Queen Anne Legs



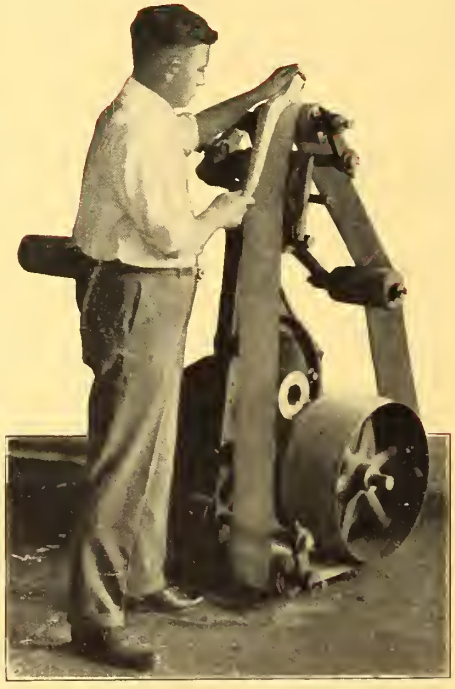
The manufacturer of Queen Anne styles can now produce the legs at exceptionally small labor cost. One man can look after the automatic leg-forming lathe in connection with the operation of the belt sander or other machine; or as many as four of the lathes can be handled by one man, because the cutting operation is purely automatic.

The Combination Makes an Efficient Method



Pneumatic sanding drums supply just the right resiliency for cleaning up the extreme curves.

FOR your beautifully designed cabriole patterns there is no other machine so well suited as the Mattison "214" Automatic Leg-Forming Lathe. It is specially designed to produce the irregular-shaped Queen Anne legs accurately and at a minimum labor cost. The cutting operation is purely automatic which reduces the labor to the actual time required to change stock. The man who tends the lathe can sand a leg on the "115" Belt Sander while another is being cut on the machine.



Sanding flat curves against cushioned sanding roll

The flexible open belt nicely finishes the rounds.

BY free-hand manipulation of the leg diagonally against the open sandbelt, shaped forms or cushioned sanding rolls, the rough sanding is accomplished very quickly. The two sizes of pneumatic sand-covered drums provide a most practical and accurate method for perfectly finish-sanding the legs. This combination of both rough and finish sanding operations in the one machine together with the lathe for automatically shaping the legs, gives the manufacturer of Queen Anne furniture a method that minimizes costs and insures accurate production of his individual and distinctive patterns.

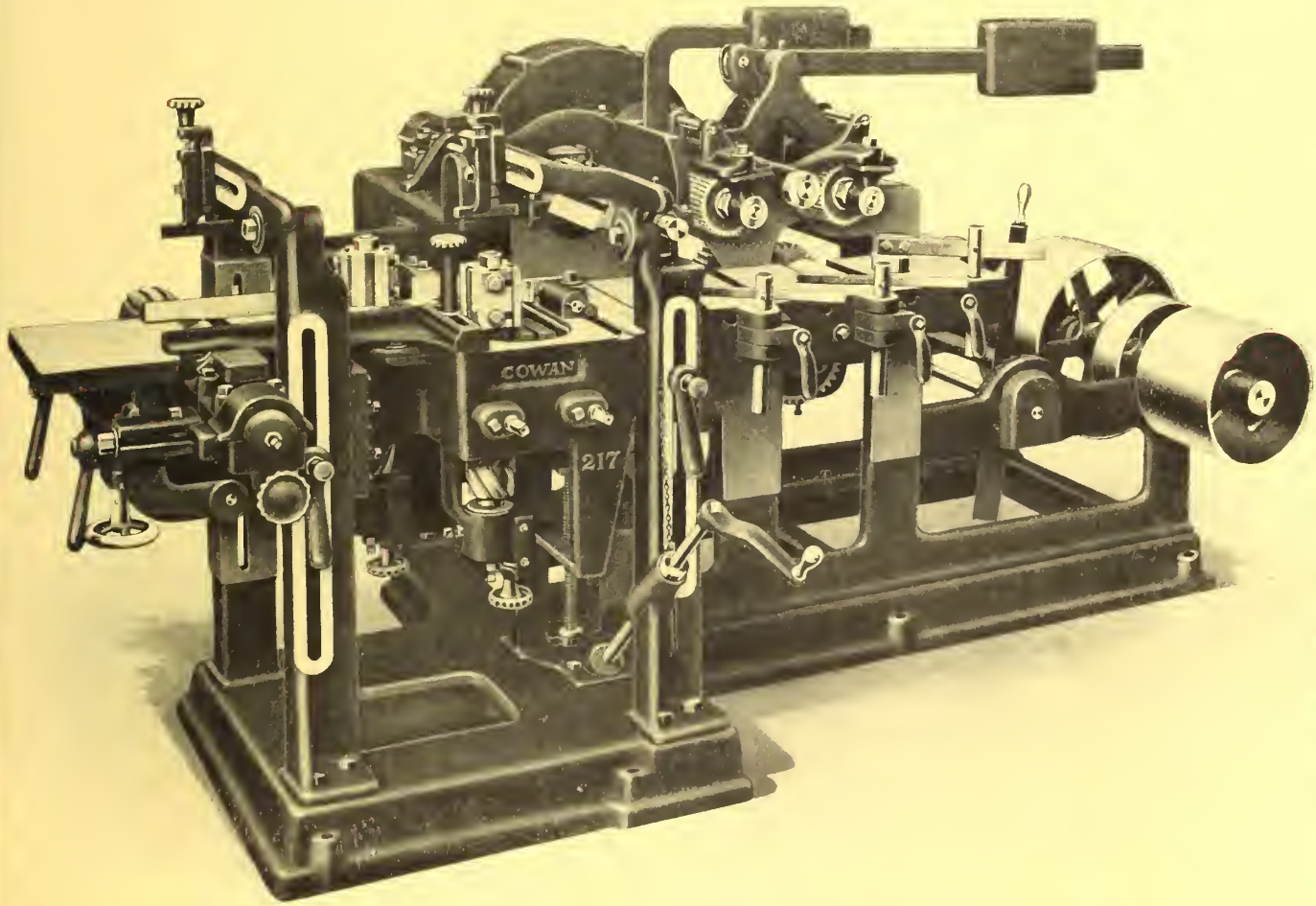
MATTISON
MACHINE WORKS
Rockford, Illinois, U.S.A.

olume Twenty-Two TORONTO, APRIL. 1922 Number Four

CANADIAN WOODWORKER and Furniture Manufacturer

8 INCH MOULDER 217

Easily Accessible for Adjustment—Substantial—Efficient



The Best In Woodworking Machinery

COWAN & COMPANY OF GALT LIMITED

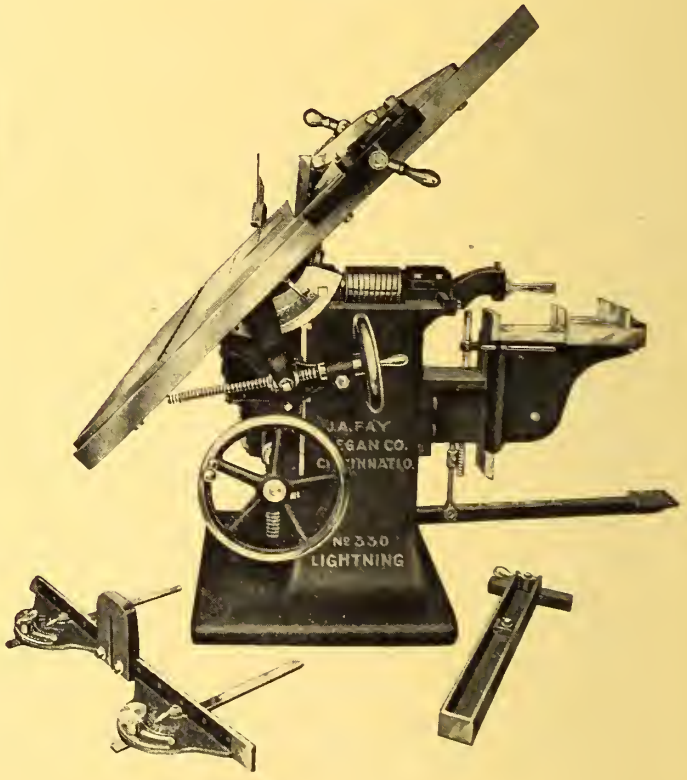
Galt Ontario Canada

Alphabetical Index to Advertisers, Page 12

YOU CAN

BORE
CROSS CUT
DADO
GAIN
MITER
MORTISE
RABBET
RIP
ROUT
AND
TENON on the

"The Lightning" Line
TRADE MARK REG.



Immediate Delivery **No. 330 "Lightning" Variety Saw**

J. A. Fay & Egan Company

Established 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St., CINCINNATI, OHIO, U.S.A.

Another "Made In Canada" Product

Re-Drier for Veneers

A most essential and money saving-machine for your Veneer Room.

We can show you this machine in operation—also under construction. Let us give you full particulars for your plant requirements.

A few more machines in our stock in addition to those advertised last month:—

54" McGregor Gourlay Band Re-Saw.

24" Jointer Herzog Power Feed Attachment

Monarch 36 x 72 Hydraulic Veneer Press, pump, trucks, retainer rods complete.

McGregor Gourlay Double End Tenoning Machine, Copes cut off saws.

Surfacers Single and Double for Cabinet Shop and Box Factory.

Cross cut saws.

Rip saws.

Railway cut off saws.

Fast Feed 15" Planer and Matchers with and without Feeding Tables.

And many other machines for Sash and Door, Cabinet, Box Factory, and Planing Mill work. All in A1 shape and all subject to prior sale.

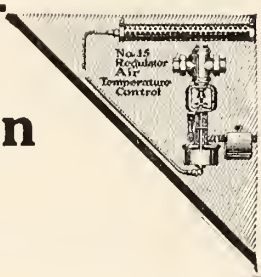
Send us your Inquiries

Garlock Machinery Limited

163 Dufferin Street

WINNIPEG - TORONTO - MONTREAL

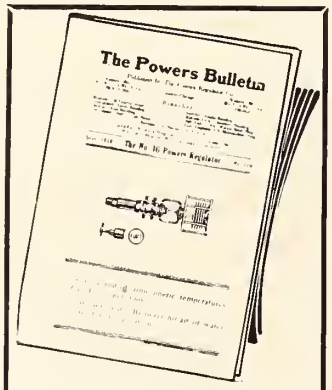
Everything in Woodworking and Metal Working Machinery



"Let Us Reason Together"

You know that it costs you money every time your dry kiln gets too hot—or the temperature rises too rapidly.

But—Do you know that Powers Automatic Heat Regulators offer a sure means for saving you that money? They do, and we want to prove it to you in your own plant, under your own working conditions. It will save you much lumber if you will accept this offer.



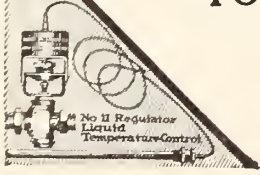
Powers Bulletins give concise, accurate information about automatic temperature control, etc., for glue pots, dry kilns, drying rooms, hot water tanks—and many other places where expense can be saved.

For more than thirty years we have been solving heat regulation problems with automatic control. Our experience is at your service.

The Canadian POWERS REGULATOR Co Ltd

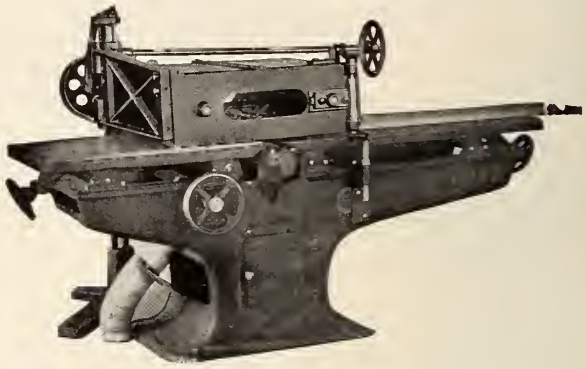
Specialists in Automatic Heat Control

82 Chestnut St.,
TORONTO, ONT.



(1732)

CONSERVATION OF MEN AND TIME



One of the greatest movements of recent years was the "Safety First" campaign and as witness of its efficiency there are many less maimed men among the rising generation of wood-workers.

It has developed that incidently with the introduction of safety devices came a marked increase in production. A certain nervous strain felt by the operator of a dangerous machine militated against his capacity.

Among the most dangerous of wood-working machines were the jointer and buzz planer, but both were rendered harmless by the

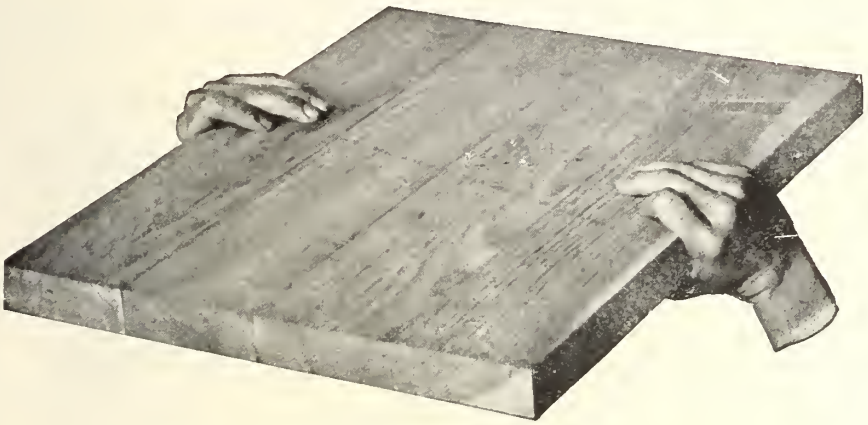
Billstrom Automatic Feeder,

the use of which rendered it impossible for the workmen to get his hands near the knives while the machine was running.

It was also found that the resilient metal fingers fed the stock faster and more uniformly than could be done by hand, resulting in largely increased production.

But a moment is required to place the feeder in position for work, or to swing it back to free the knives when they need attention.

N. J. BILLSTROM
2002 Ninth Street
Rockford, Ill.

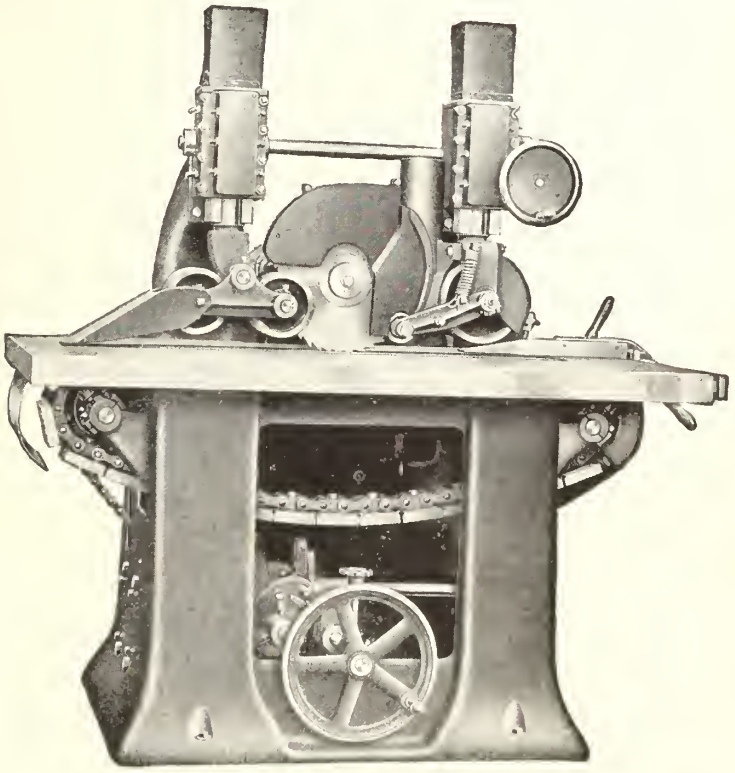


Yates

The machine shown on right is our type G-2 Ripping and Edging Saw.

This saw will cut a perfectly straight line without the use of a ripping guide.

The cut above shows the perfect joints that can be made on this Saw. In the preparation of cored stock for veneered work, such as veneered doors, panels, table tops etc. this saw gives the lumber such a smooth, straight, even cut, that subsequent jointing is unneccessary to give a satisfactory glue joint. The saw arbor is mounted in combined thrust and radial ball bearings. This fact, together with the roller and ball bearings used in the feed rolls assures a smooth-running, highly efficient machine under all conditions.

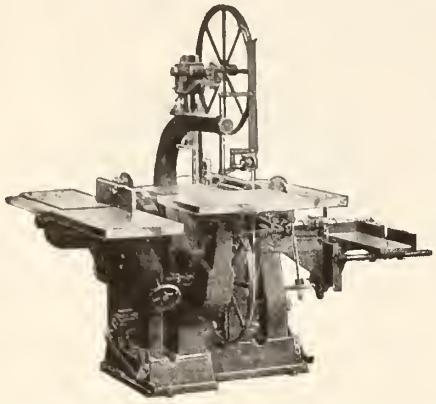


Our illustrated circular outlines the many uses this machine can be put to. Simply drop us a line for your copy and obtain information that will be of benefit to you.

P. B. Yates Machine Co. Ltd.

Hamilton - Canada

Crescent Universal Woodworker

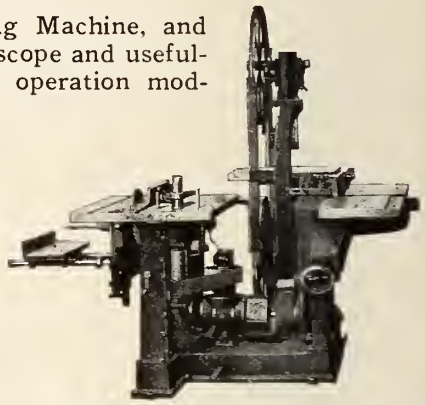


Saves Time and Earns Money

To the builders and contractors contemplating large building operations this coming season the Crescent Universal Woodworker will mean a large saving in mill work beside the convenience of having material cut and finished on the job when and where they are wanted. The sawyer's time alone will pay for the machine in a short while.

Every Builder Should Have This Money-Making Machine

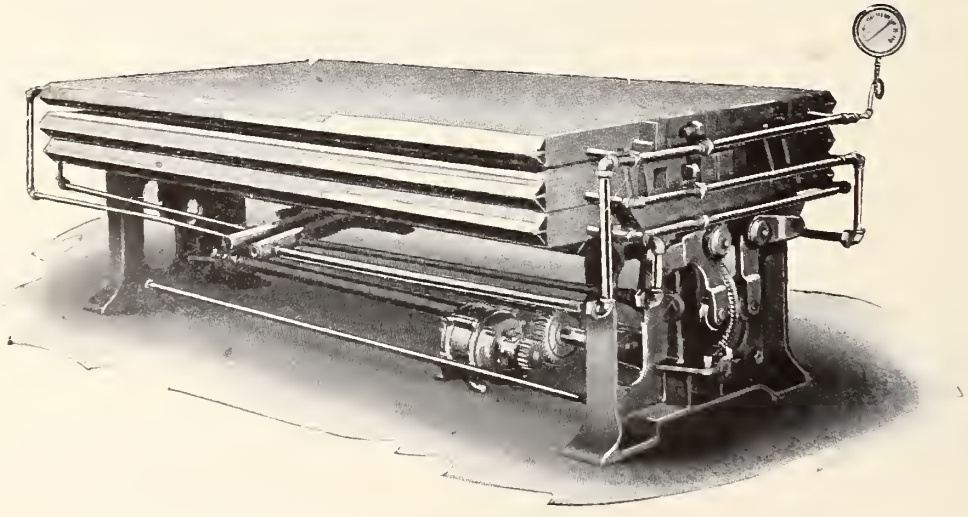
Standard equipment includes:—Band Saw, Saw Table, Jointer, Boring Machine, and Shaper. A number of other attachments ca n be added to increase the scope and usefulness of the machine. Floor space is limite d and power required for operation moderate.



Write for further information.

The A. R. Williams Machinery Co. Ltd.
Dept. T.C. **20 Front St. W., Toronto**
Halifax St. John Montreal Winnipeg Vancouver

IF ITS MACHINERY WRITE "WILLIAMS"



The "Merit" Three-Plate Veneer Re-Drier

has two openings only and is designed for plants having need of a re-drier of moderate cost and of limited capacity.

The machine is electrically driven and is piped for connection with the factory steam line.

A vertical movement of the middle plate gives the veneer pressure first in one opening and then in the other and provides the well-kown "Breathing Movement" peculiar to Merit Re-Driers.

MERRITT ENGINEERING & SALES COMPANY
Lockport, N. Y.

MESCo

The "Merit"
Re-Drier
FOR VENEER

INSURE your veneer work against surface checks, hair lines, blisters, warping and glue failure by installing a "Merit" Re-drier.

Thoroughly dry and flat veneer avoids these troubles, gives tight joints and saves glue.

No system of air drying will accomplish this result. Hot Plates with "breathing movement" are the thing.

MERIT

The Shimer Round Safety Cylinder with High Speed Knives

A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

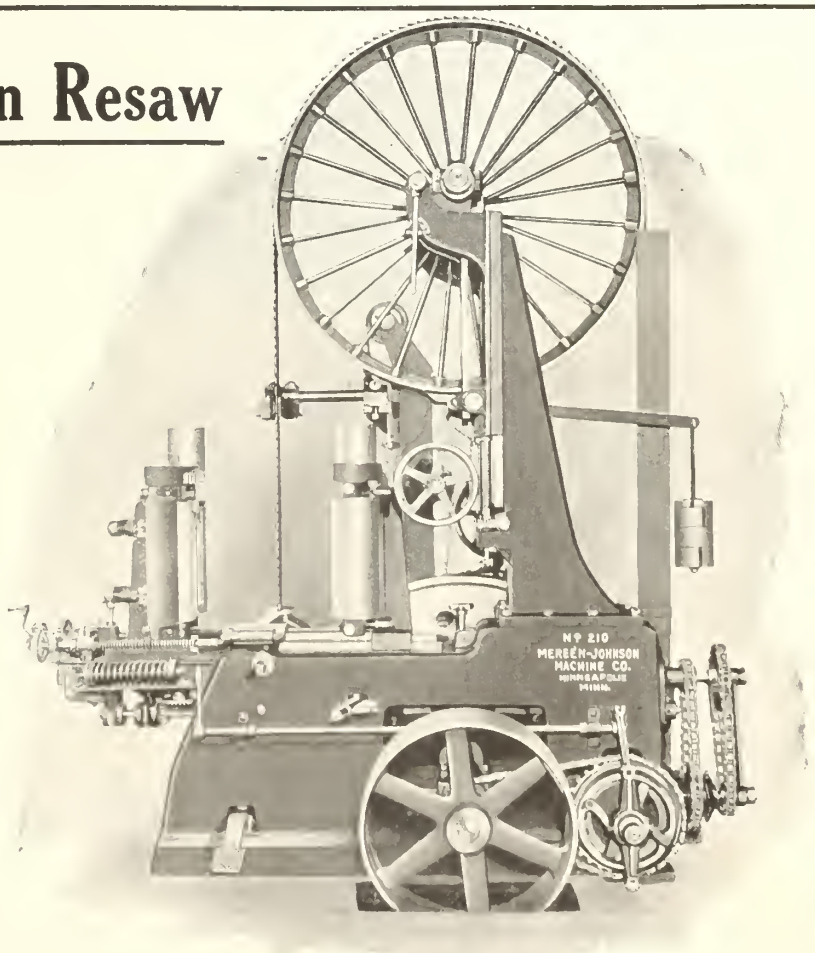
The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

No pulleys—no belts—no frictions.

The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

Write for circular.



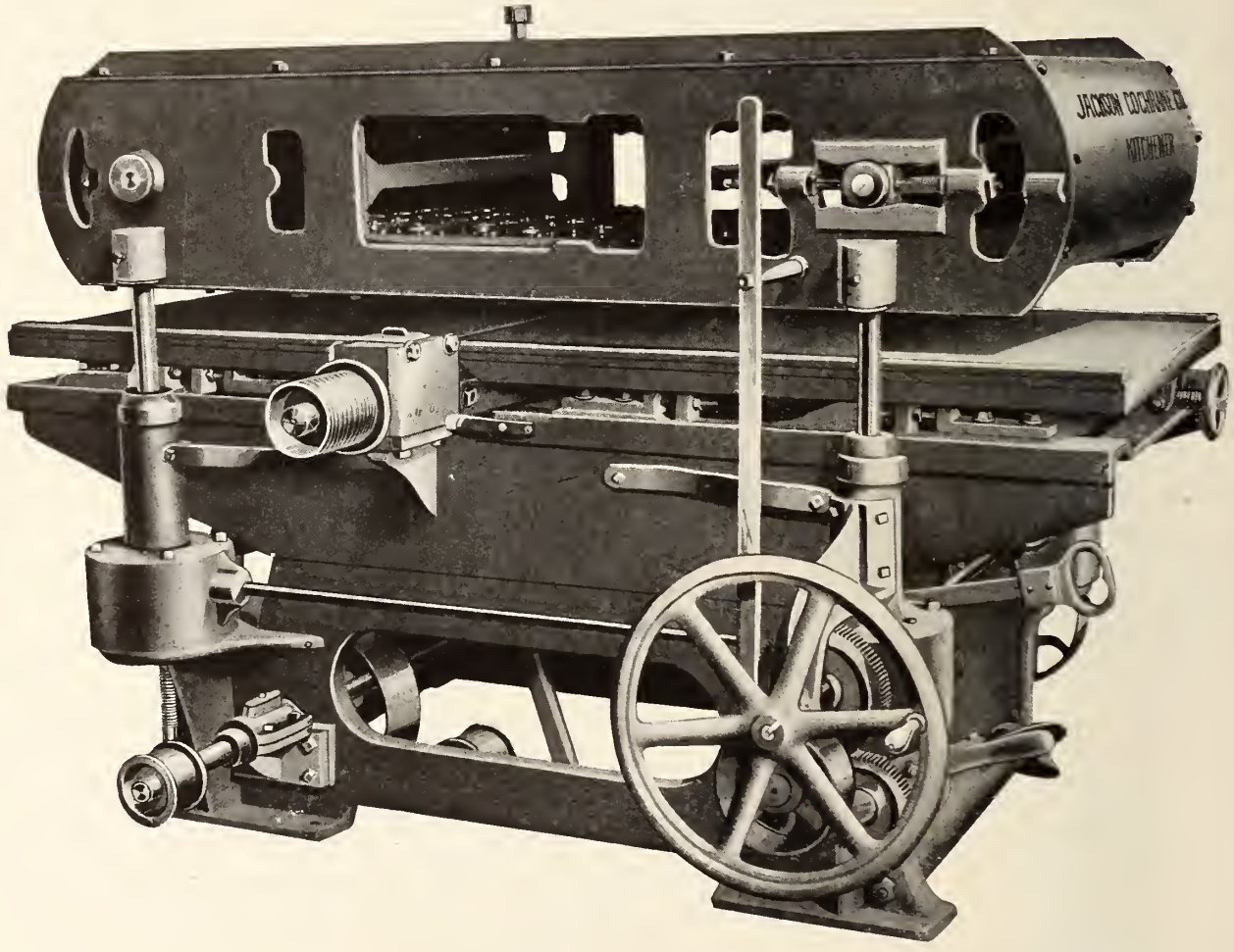
Mereen-Johnson Machine Co.

Minneapolis Minnesota, U.S.A.

"The Best Equipment Possible for the Work it is Intended to Do"

-Says *Panels, Limited*

of Southhampton, Ont.



This machine not only increases production while lowering operating costs but entirely eliminates the dangers to which the operator of the old style buzz planer was subjected.

Just consider these facts:

It handles stock of any dimension, hard or soft, at four times the speed of the old method; occupies but one fourth the space required by four hand jointers; requires but one-fifth of the sharpening of the knives as the hand fed jointer and is easily operated by two boys.

These facts we shall be glad to prove to anyone interested in such a machine.

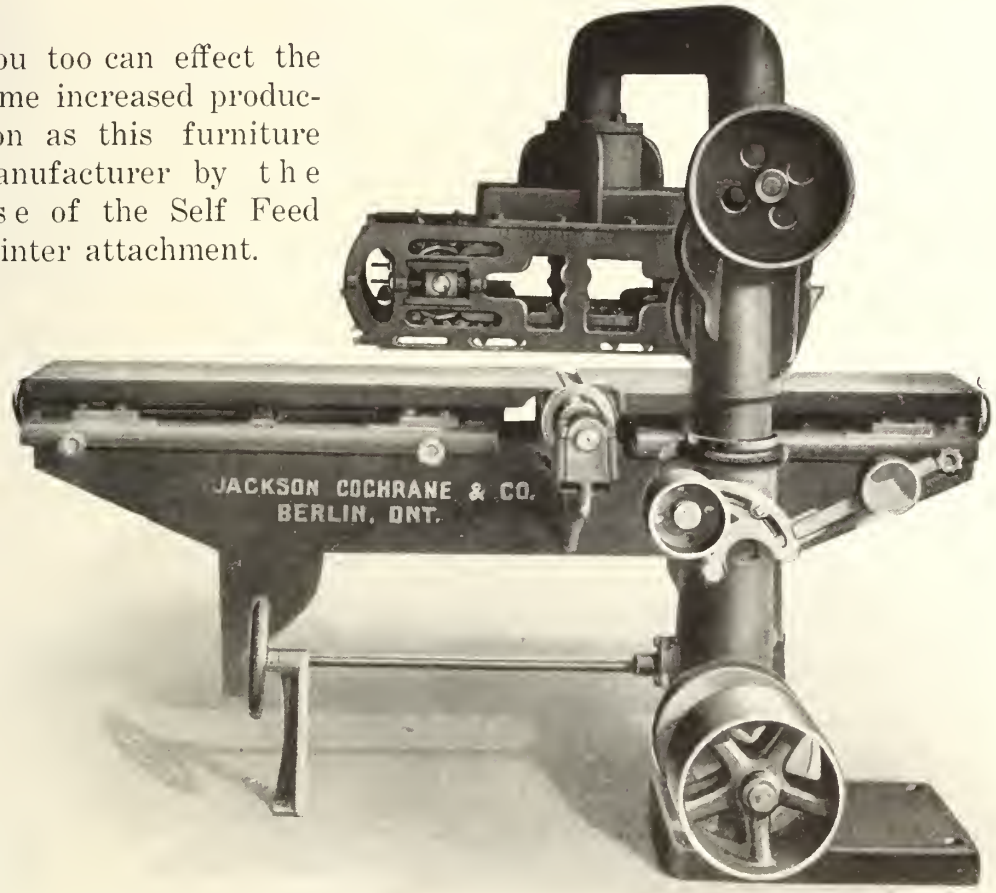
Read over the article on the Herzog Self-Feed Jointer contained elsewhere in this paper.

Jackson, Cochrane & Company

KITCHENER - CANADA

"We can Feed from Two to Three Times as Fast as Formerly"

You too can effect the same increased production as this furniture manufacturer by the use of the Self Feed Jointer attachment.



For factories having but one or two jointers and desiring to use same at times for squaring or edging, this Herzog Swing Out Jointer Attachment is especially desirable, as the attachment can be quickly swung free from the jointer.

It is of the same general design as the four post machine except that the feed is shorter and is hung from a single post. We guarantee this machine to increase the capacity of the hand fed jointer from THREE TO FOUR TIMES.

One user writes "We would not be without this machine as it has proven one of the very best machinery investments we have made."

Read over the article on the Self-Feed Jointer Attachment contained elsewhere in this paper.

Jackson, Cochrane & Company

KITCHENER - CANADA

A battery of 12 "Preston" Woodworking Lathes as installed at the Central Technical School, Toronto

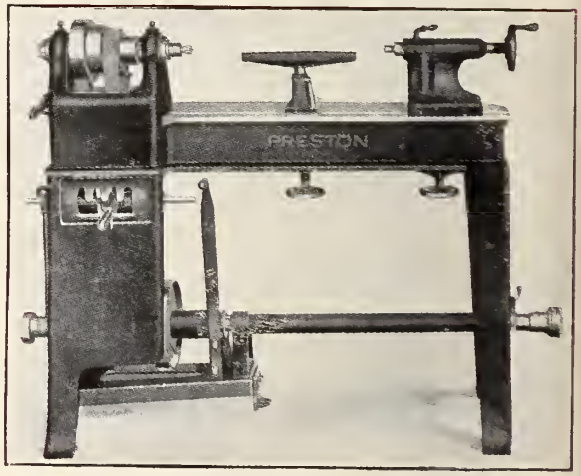
The finest Institutions in Canada use

PRES

No better evidence of the value of Preston Standard Woodworking Equipment could be shown than the installations in the Technical Schools of Toronto, Hamilton, Ottawa, Niagara Falls, Windsor, Chatham, Woodstock, Sudbury, Fort William, Prince Rupert, B.C., Chilliwac B.C., and London, Ontario.

The Institute for the Blind at Belleville and a number of Soldiers' Civil Re-establishment Schools may also be added to the list of users of Preston Equipment. The machines shown on these 2 pages are standard equipment for Technical Institutions and have been used to entire satisfaction all over the Dominion.

Another battery of "Preston" Lathes and Preston Double Arbor Grinder as installed in the Central Technical School, Toronto



"Preston" Manual Training Speed Lathe, used in Technical Schools of Canada

The Preston Woodworking

PRESTON, ONT.

To appreciate better the superior construction of these machines you should send for complete description.

TON

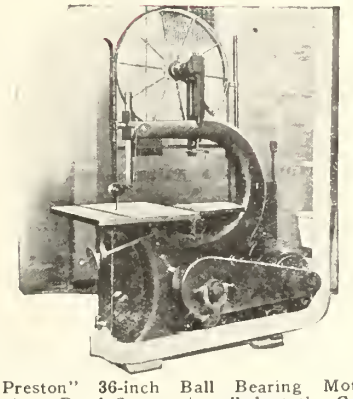
Woodworking Machinery for Manual Training Purposes

lowing is a list of Preston Maines in the Central Technical ool, Toronto:

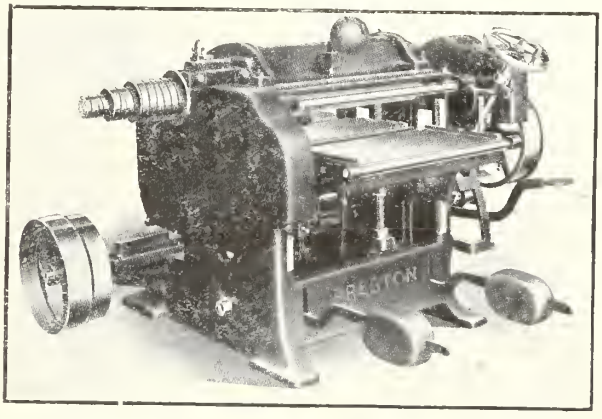
3 Manual Training Lathes.
3 Band Saws.
3 Saw Tables.
2 Buzz Planers and Jointers.
1 Ball Bearing Shaper.
1 Sander.
1 Power-Feed Saw.
1 Roller-Top Saw Table.

these machines have ball bearrs and individual motor drive.

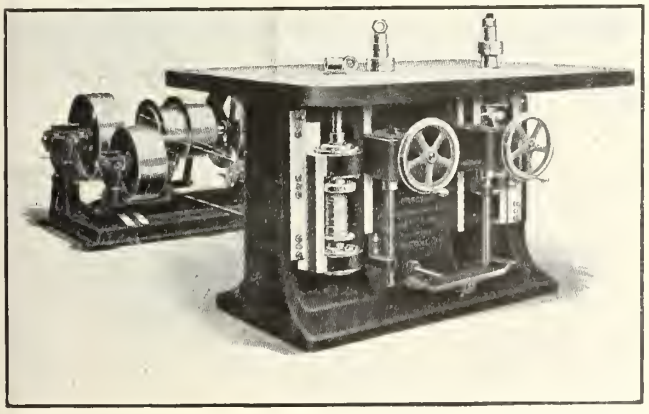
"Preston" Motor Driven Ball Bearing Buzz Planer and Jointer, as installed at the Central Technical School, Toronto.



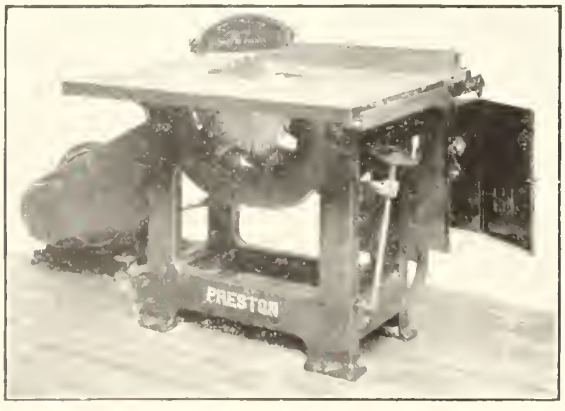
"Preston" 36-inch Ball Bearing Motor Driven Band Saw as installed at the Central Technical School, Toronto



"Preston" Pony Planer of improved design, as now installed in various technical schools.



"Preston" High Speed Ball Bearing Shaper as installed in Toronto, and a number of other Canadian Technical Schools



"Preston" Motor Driven Ball Bearing Saw Table as installed at Central Technical School, Toronto

Machinery Company, Limited

ANADA

Alphabetical List of Advertisers

Adjustable Clamp Co. 113
Algoma Panel Co. 91
American Hardwood Lumber Co 27
American Saw Filing Machine Co. 107
Anderson Tully Co. 99
American Walnut Mfrs. Association 28
Atlantic Lumber Company 4
Atkins & Co., E. C. 123
Atlas Mfg. Co., of Orlando 100
Ault & Wiborg Co. 80

Bachman Co., F. M. 96
Batavia Clamp Co. 113
Banning, Leland G. 49
Behr Co., Inc., Herman 19
B. C. Lumber Commissioner 27
Bigelow-Cooper Lumber Co. 29
Barr-Holaday Lumber Co. 35
Bell Machine Co. 21
Bilstrom, Nels J. 4
Birds Eye Veneer Co. 82
Black Bros., Co. 111
Bonner & Sons, J. H. 34
Brantford Pattern Works 122
Bruce Co., E. L. 49
Bruce Woodworkers Ltd. 17
Buffalo Hardwood Lumber Dealers 12

Calhoun Plywood Co. 32
Canada Machinery Corporation 15
Canada Wood Specialty Co. 46
Canadian Appraisal Co. Ltd., The 17
Canadian Blower & Forge Co. 123
Canadian General Lumber Co. 105
Canadian Powers Regulator Co. 4
Canadian S. K. F. 115
Carborundum Co. 117
Carter & Co., E. T. 80
Casein Mfg. Co. 22
Central Veneer Co. 87
Chapman & Dewey Lumber Co. 32
Chattanooga Machinery Co. 122
Clamp Nail Co. 109
Clarke Edward & Sons, Ltd. 44
Coignet Chemical Products Co. 119
Colborn, C. B. 34
Comfy Cushion Co. 75
Cowan & Co. 1

Delaney & Pettit Limited 76
Des Moines Sawmill Co. 36
DeVilbiss Mfg. Co. 81
Doon Twines 76
Dry Kiln Door Carrier Co. 111
Dunlop Tire & Rubber Goods Co. 109

Eagle-Ottawa Leather Co. 74
Eaton & Sons, J. R. 28
Elliot Machinery Co. 121
Engineering & Machine Works of Canada Ltd. 120
Empire Tool Works 113

Farrin Lumber Co., The M. B. 50
Fay & Egan Co., J. A. 2
Flint Varnish & Color Works of Canada Ltd. 80
Foster, Merriam Co. 25
Frye Lumber & Veneer Co., J. W. 86

Garlock Machinery Ltd. 3
General Machinery Co. 104
General Hardwood Lumber Co. 30
Globe Vise & Truck Co. 119
Grand Rapids Vapor Kiln 20
Guelph Patent Cask. Co. Ltd. 111
Gulf Lumber & Trading Co. 41

Hafner Mfg. Co. 48
Hartzell, Geo. W. 37
Hay & Co. 97
Hay & Co., Peter 107
Hawker Mfg. Co., W. S. 18
Hewit Lumber Co., D. E. 40
Heeney, Percy E. 32
Hoffman Bros., Co. 87
Hyde Lumber Co. 34

Ideal Fence & Spring Co. of Canada, Ltd. . 75
Industrial Engineering Co. 109

Jackson Cochrane & Co. 9

Kinnon Lumber Co., Ltd. 107
Klise Mfg. Co. 108
Klotz Machine Co. 111
Kosse, Shoe & Schleyer Co. 45
Kraetzer-Cured Lumber Co. 103

The Handiest Machine on the Market

The Split-tilting table (Patent Applied For) can be tilted and locked at any angle up to forty-five degrees as indicated on the graduated segment. This machine is also supplied with a solid table. The Boring Attachment is very complete in itself. A foot lever is connected with the table which slides back and forth on the knee. A large coil spring located in the column of the machine automatically releases the work from the bit when pressure is removed from the foot lever. The Boring Attachment is raised or lowered by means of a handwheel connected with a pair of mitre gears. The spindle is bored to take standard size bits and can be arranged for a hollow chisel mortiser. Special cutters may be used by removing the throat in the table. Each machine is furnished with one ten inch saw, belt and wrench.

Write for prices and pamphlet describing this time and labor saver more fully.

D. McKenzie Machinery Co.
MANUFACTURERS
GUELPH, ONT. CANADA

Cross-cut Mitre & Rip Saw Machine showing Split-Tilting Table & Boring Attachment

What is the Most Essential Thing to Consider in Purchasing Dry Kiln Equipment?

We would say that the very most important thing to be considered is the fact that the value of the lumber dried in a kiln during a year is at least ten times as great as the cost of the kiln, including buildings, equipment and installation.

Perhaps you have always considered the "PRICE of EQUIPMENT" to be the most important phase. But if one kiln will do the work better than others, its value as a manufacturing facility is such that it does not make any difference whether it costs more or less than some other equipment.

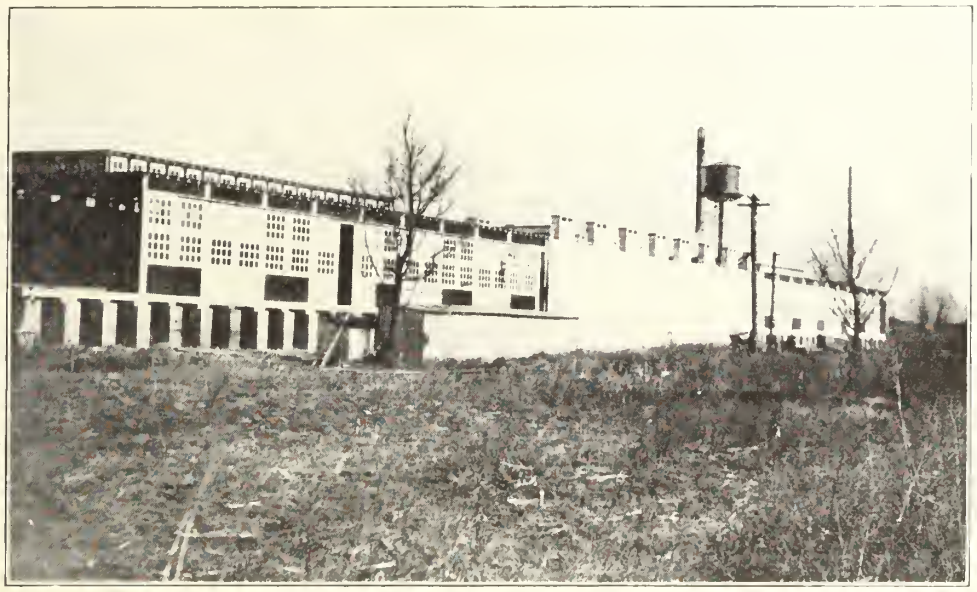
In fact, if only ten per cent of the gross amount of lumber is damaged in one kiln because of poor facilities, the kiln which will save this ten per cent pays for itself every year.

Now, if the prospective purchaser of dry kiln equipment does give consideration to this most essential point, then, of course it devolves upon him to select this better kiln. He can not do this by selecting the highest priced kiln, or the lowest priced kiln, or on any price basis.

You understand the serious problems of lumber drying sufficiently to know that in your kiln you must have power, distribution, flexibility and control to do the work properly. You know there is a difference in the way these things are provided by various kiln engineers.

NATIONAL KILNS ARE DIFFERENT in that they have:—

1. More Abundant Power.
2. Better Distribution.
3. Most Flexible Arrangement.
4. Automatic Control.



We will guarantee to cure your lumber to your entire satisfaction, without degrade or waste, in the least possible time and at a minimum cost in operation. Whether in need of a new kiln, or the remodeling of your present installation, kindly write us to-day.

C. A. FIELDS, Canadian Representative, P. O. Box 55, TORONTO

OR

The National Dry Kiln Co., 1117 East Maryland Street., Indianapolis, Indiana

NATIONAL DRY KILNS

"The First Kiln in 6,000 Years in Which Humidity is Automatically Controlled."

MAPLE LEAF SAWS

made in Canada by the largest ALL CANADIAN SAW MANUFACTURERS.

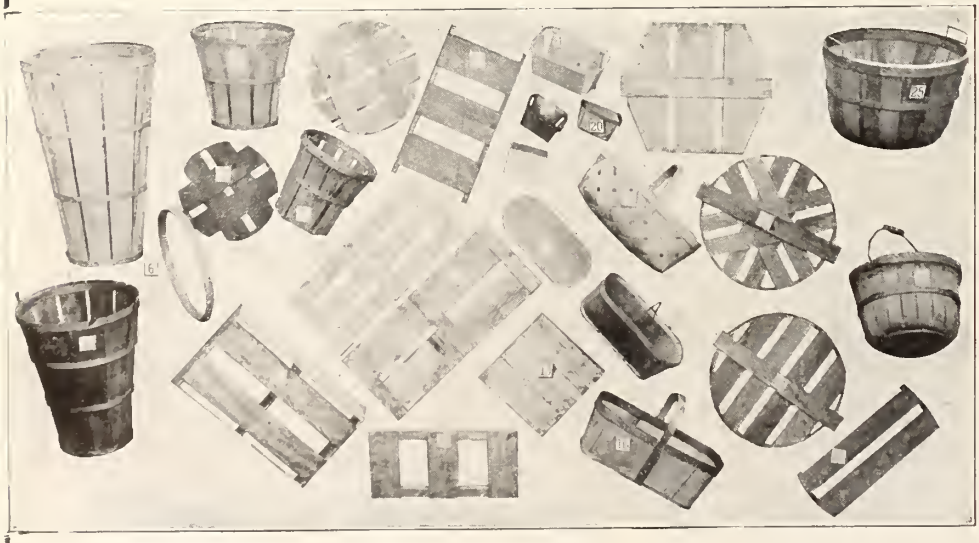
Inserted Tooth Saws, Solid Tooth Saws, Shingle Saws, Lath Saws, Special Grooving Saws, Dado Heads, Band Saws, Hand Saw .

Have you received a copy of our new low prices yet? If not, may we send you one.

Shurly Dietrich Company Limited

Galt - Ontario

THIS IS THE NAME



of the Machinery for the Rapid Production of

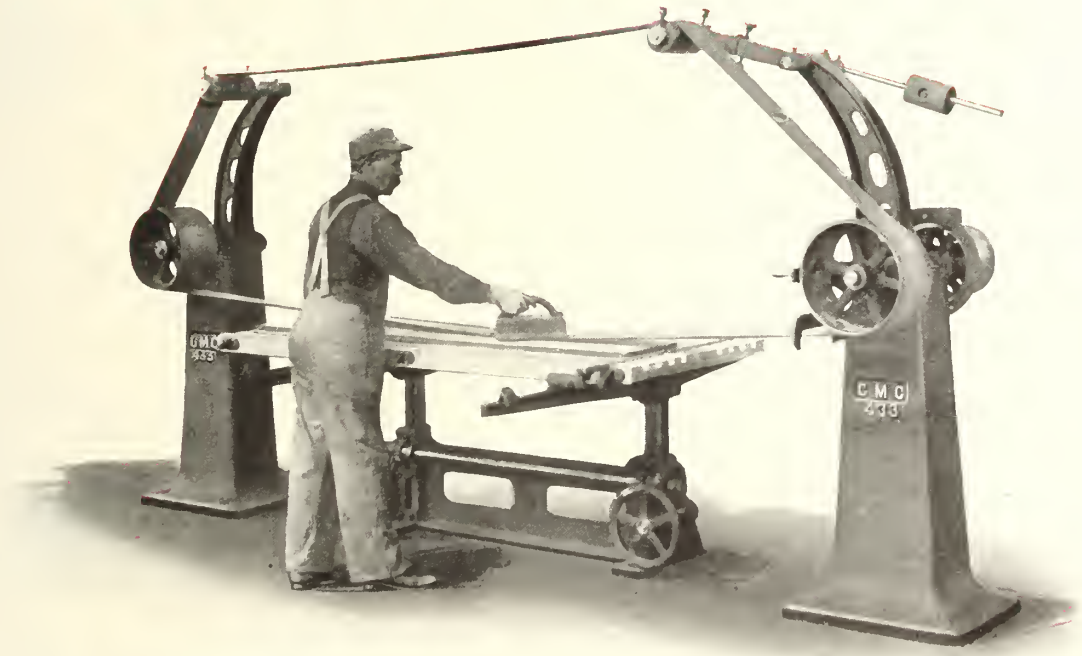
Veneer—Crates—
Baskets—Fruit Packages.

"ST JOE"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

Power Sanding with the Human Touch



C.M.C.

No. 433 Hand Block Belt Sander

This Sander combines that perfection of finish that can only be obtained by the human hand and eye with power production.

No other form of sanding machine yields itself to so many and varied uses. The small job, and the large job—flat work or irregular work—all come within its range.

A green hand can operate it. He soon " gets the feel" of the block and a little experience soon makes him as good as the best.

Complete details on request.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office 721 Bank of Hamilton Bldg.

Alphabetical List of Advertisers—Continued

Laidlaw Bale-Tie Co. ... 20
Larsen & Shaw Ltd. ... 108
Litton Veneer Co. ... 86
Liverpool Hardwood Co., Inc. ... 18
Long-Knight Lumber Co. ... 97
Luehrmann Hardwood Lumber Company, Chas. F. ... 27

Maley & Wertz Lumber Co. ... 41
Marietta Paint & Color Co. ... 76
Mattison Machine Works ... 124
May Hardwood Co., R.R. ... 27
McDonagh Lumber Co. ... 32
McKenzie Machinery Co., D. ... 12
McKnight & Son Co., L. G. ... 122
McLennan Lumber Co., Limited ... 46
Memphis Bandmill Co. ... 35
Memphis Veneer & Lumber Co. ... 87
Mercereau Hawkins Tie Co. ... 47
Mereen-Johnson Machine Co. ... 7
Merritt Engineering & Sales Co. ... 4
Miller Lumber Co. ... 31
Mohawk Veneer Co. ... 86
Monite Glue ... 26
Morgan Machine Co. ... 121
Mowbray & Robinson ... 38
Munising Woodenware Co. ... 96
Murelle Lumber Co., L. D. ... 41

Nash, J. M. ... 122
National Dry Kiln Co. ... 18
Neville-Cooper Co. ... 22
Nichols & Co., A. S. ... 81
Nichols & Cox Lumber Co. ... 34
Northwestern Cooperage & Lumber Co. ... 85

Oakey & Sons, John ... 17
Ober Manufacturing Co. ... 113
Ohio Veneer Co. ... 85
Oliver Machinery Co. ... 17
Oriental Textiles Co. ... 75
Otis Mfg. Co. ... 43
Overton, S. E. ... 119

Pedwell Hardwood Lumber Co. ... 28
Penrod-Jurden Co. ... 88
Penrod Walnut & Veneer Co. ... 88
Perkins Glue Co. ... 23
Perrin Ltd., Wm. R. ... 109
Petrie Ltd., H. W. ... 119
Pettingell Machine Co. ... 107
Pickrel Veneer Co. ... 89
Preston Woodworking Mach. Co ... 10-11
Purcell Walnut Lumber Co., Frank ... 38

Radcliff Saw Mfg. Co. ...
Reese-Sheriff Lumber Co. ... 45
Reynolds Machine Co. ... 110
Richards Hardwood Co. ... 30
Richards-Wilcox Canadian Co. ... 107
Rush Lumber Co. ... 39

Shantz, P. E. ... 22
Shimer Cutter Head Co. ... 7
Shurly Dietrich Co. ... 14
Sidmans Limited ... 105
Simonds Canada Saw Co. ... 112
Smith Lumber Co., Payson ... 27
Smith, Sam D. ... 30
Sondheimer Co., E. ... 29
Standard Dry Kiln Co. ... 16
Standard Veneer Co. ... 87
Stark & Co., Jas E. ... 47
Steels & Hibbard Lumber Co. ... 47
Stimson & Co., J. V. ... 40
Stimson Hardwood Co. ... 33
Stimson Veneer & Lumber Co. ... 33
St. Joseph Iron Works ... 14

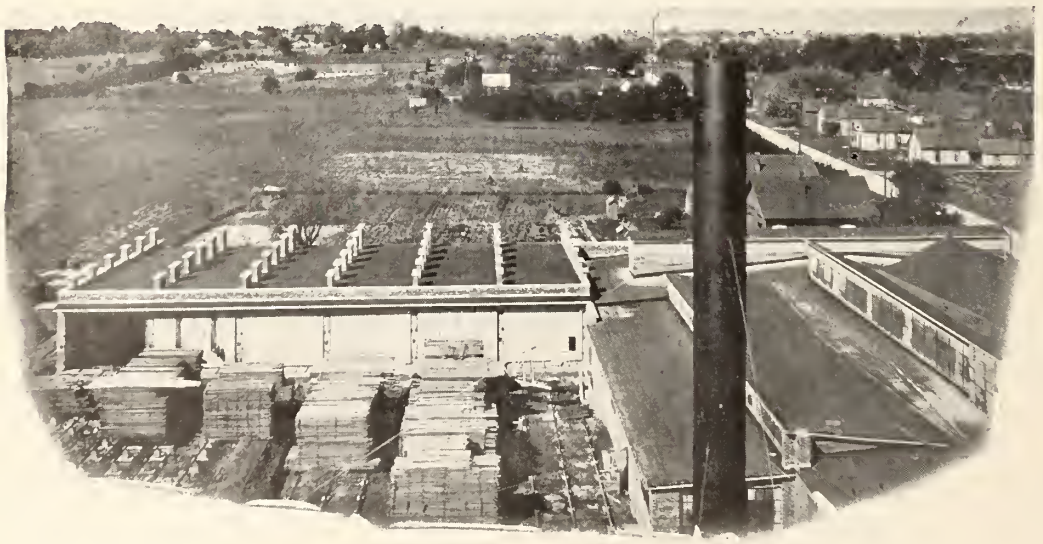
Taylor Mfg. Co., Jas. L. ... 110
Tennessee Lumber & Coal Co. ... 39
Thomas & Proetz ... 31
Toronto Veneer Co. ... 95
Turner-Farber-Love Co. ... 101

Vail Cooperage Co. ... 48
Valley City Machine Works ... 20
Van Atta & Co., E. B. ... 111
Veneer Manufacturers Co. ... 89

Waddell Mfg. Co. ... 108
Walter & Sons, J. ... 24
Watertown Table-Slide Co. ... 22
Wayne Lumber Co. ... 40
Whiting Co., Wm. S. ... 47
Willey Co., C. L. ... 93
Williams Machinery Co., A. R. ... 6
Williamson Veneer Co. ... 90
Wisconsin Veneer Co. ... 86
Wood Mosaic Co. ... 92

Yates Machine Co., Ltd. P. B. ... 5
Yellow Poplar Lumber Co. ... 39
Young Lumber Co., Bedna ... 40

SHOWERS— 1---tried these at Bloomington, then 2---duplicated them at Burlington.



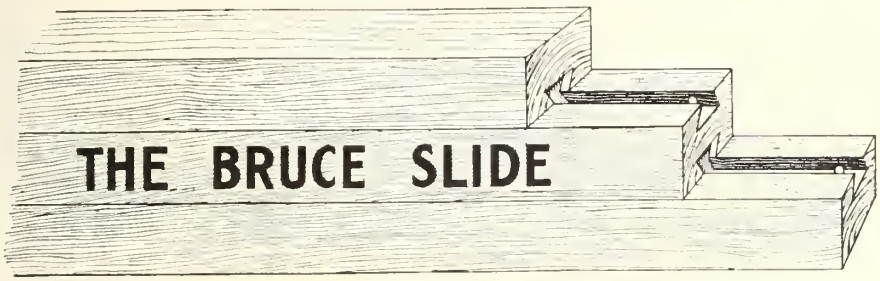
Because

they had tried other kilns at Bloomington, had investigated further, then tried these Standard Kilns at Bloomington and made comparisons. Now all three plants Use

THE STANDARD DRY KILN

MODERNIZE your present kilns. A few changes may be all that's needed. Lots of firms are doing this now. Our engineering department is helping on just such work—advising with prominent concerns that are overhauling. Operators are writing, telling us their particular drying problems. Tell us yours—send a brief description of your kiln—we will tell you how to go about modernizing it. Address The Standard Dry Kiln Co., 1542 McCarty St., Indianapolis, Ind.

TABLE SLIDES TABLE RIMS TABLE PINS

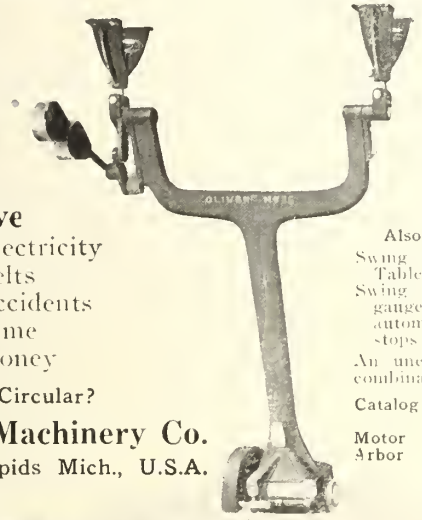


Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

"OLIVER"
Motor Arbor
Swing Saw

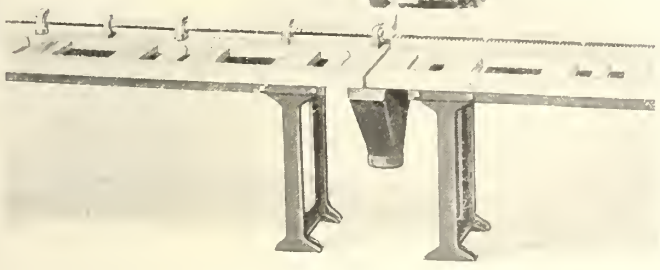


You Save
1. Electricity
2. Belts
3. Accidents
4. Time
5. Money

Circular?

Oliver Machinery Co.
Grand Rapids Mich., U.S.A.

Also note
Swing Saw Table
Swing Saw gauge, and automatic stops
An unexcelled combination.
Catalog?
Motor Arbor



The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5,000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

OAKEY'S

Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

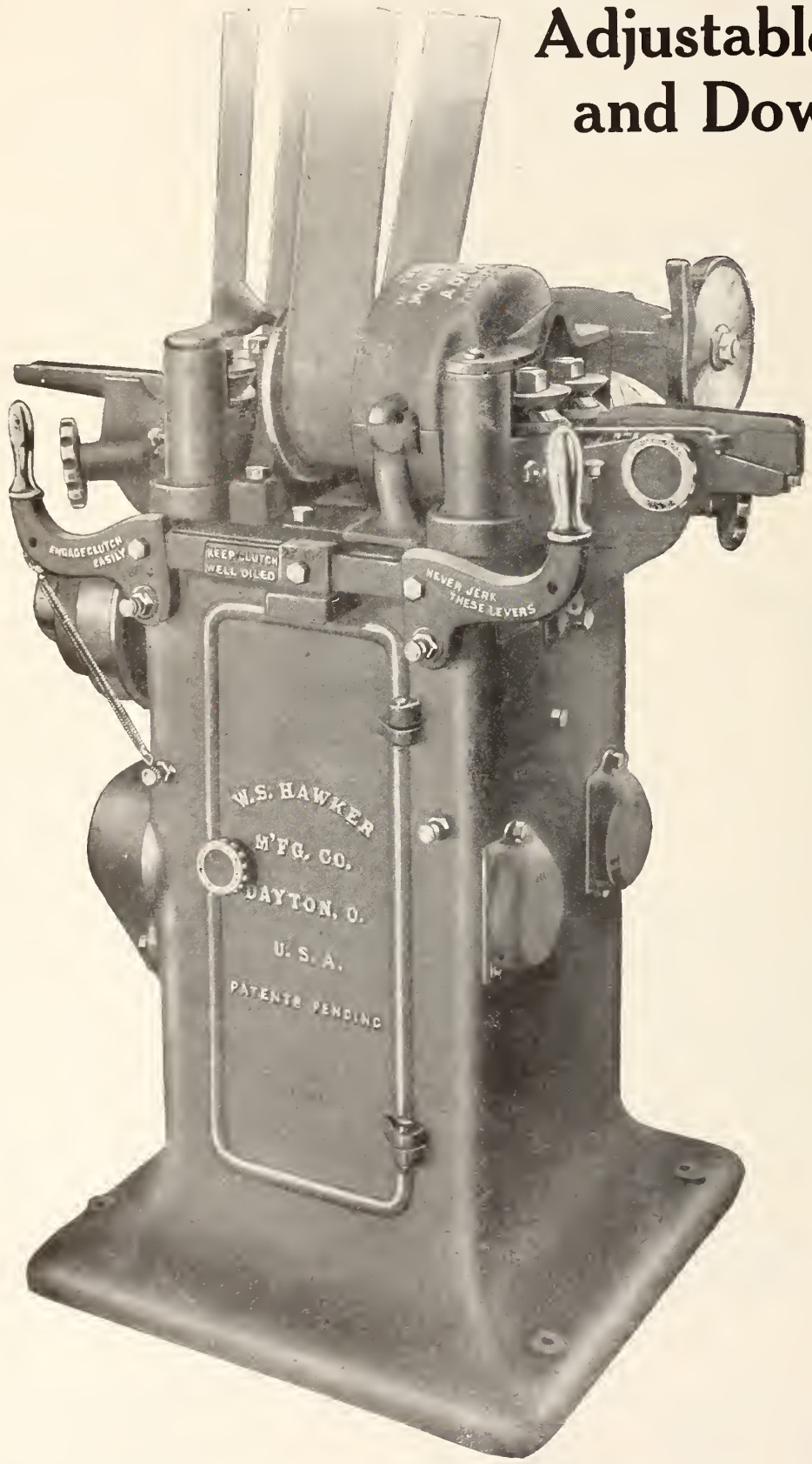
SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

JOHN OAKEY & SONS LTD.,
WELLINGTON EMERY AND BLACK LEAD MILLS
LONDON, S. E. 1.

Canadian Agents:

F. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

The Money Maker—
Adjustable Rod and Dowel Machine



Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

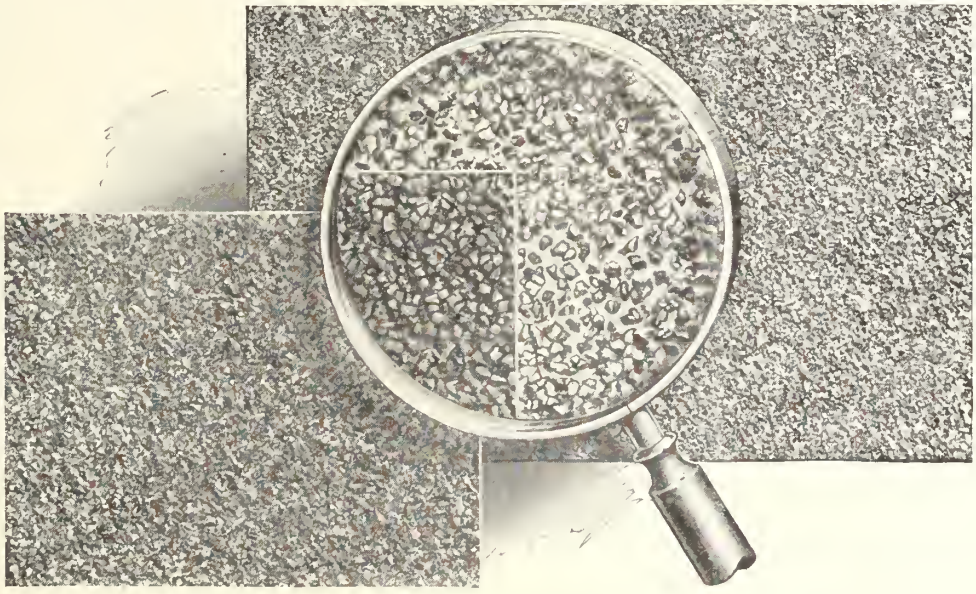
The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely
Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio

Behr's OPENKOTE Garnet Finishing

Will Double Your Finishing Output



Sandpaper becomes useless when the "valleys" between grains fill up with dust or shavings—long before the kernels wear off. Behr's OPENKOTE Garnet Finishing, shown at the right, is made with *twice* as many and *wider* "valleys" than ordinary papers.

The greatest progress in the development of sandpapers and abrasive materials during the past generation is illustrated by the difference between the papers still in use and Behr's OPENKOTE Garnet Finishing.

Instead of heaping a mass of kernels upon one another and producing a wavy, uneven surface, the Garnet kernels are scientifically spread so that each grain can do its full quota of work. The invention by this Company in 1918 of the OPENKOTE Process of applying kernels of abrasive to paper, has made it possible for you to secure a new quality of sandpaper that will doubly outlast the old types of finishing papers still in general use.

OPENKOTE is flexible, light and easy to handle. Its cutting and lasting qualities are so vastly superior to the ordinary papers that OPENKOTE will do *twice* as much and faster work. The wide valleys and even distribution of grains insure complete dust clearance and the smooth, even surface prevents scratching.

Years of exhaustive experiment and trial have proven these facts beyond doubt. Send for samples of OPENKOTE for comparative tests with the paper you are now using; a post card specifying grades desired will bring them to you, without charge.

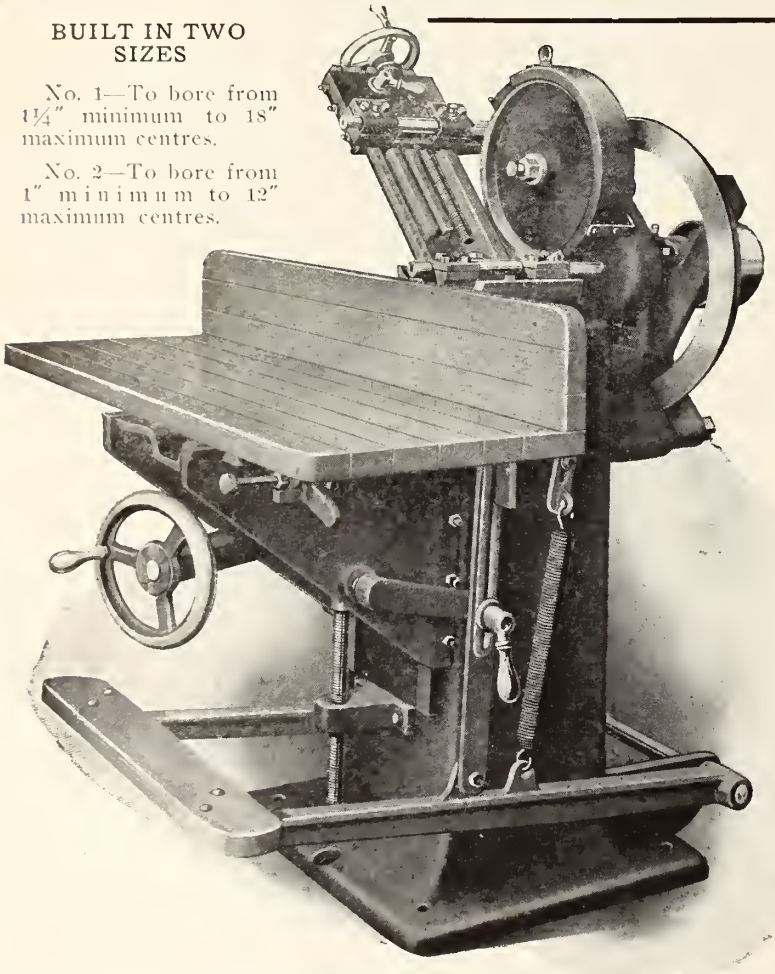
HERMAN BEHR & CO., Inc., 31-63 Tiffany Place, Brooklyn, New York
Boston Chicago Grand Rapids San Francisco St. Louis Toronto

1872—*Pioneers in the Improvement of Sandpapers for Fifty Years*—1922

BUILT IN TWO SIZES

No. 1—To bore from 1¼" minimum to 18" maximum centres.

No. 2—To bore from 1" minimum to 12" maximum centres.



VALLEY CITY MACHINE WORKS GRAND RAPIDS MICH U.S.A.

DOUBLE SPINDLE RADIAL BORING MACHINES

This machine is the standard of the furniture manufacturing world. It is finished with accuracy and combines versatility with never failing reliability.

The table is actuated with a central connecting rod, preventing the bureau drawer effect. The large intermediate gear is supported at any position by the large segment on the rear of the column. This rigid support eliminates the vibration set up by the action of the teeth and materially prolongs the life of the spindles.

A new **Close Center Attachment** has recently been perfected. It is universal and will bore two 5/16" holes anywhere in a circle of 1¼" with minimum centers of ½".

The new **Quick Action Clamp** attaches to the fence and eliminates the old stick.

Remember we can bore all of your holes at one time if you so desire

VALLEY CITY MACHINE WORKS
Campau Ave. and Fulton St., N. W.
Grand Rapids, Michigan, U. S. A.

Subscribe for the
Canadian Woodworker
and
Furniture Manufacturer
Only $2.00 per year

NAILS AND WIRE

For Every Need in the Woodworking Industry

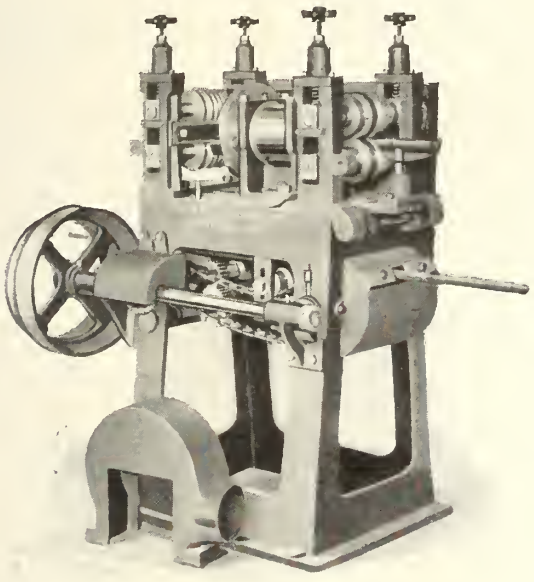
Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

Laidlaw Bale-Tie Co., Ltd.

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

Make Your Own Dowels With the "BELL" Machines

The Fastest and Most Practical Equipment For the Purpose



Adjustable Rod and Dowel Machine

The fastest dowel machine in the world.

Constructed to withstand the heavy and constant strain to which this type of machine is subjected.

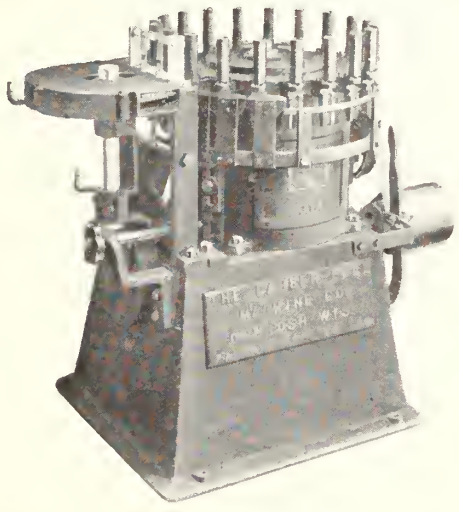
Equipped with a universal four-knife cutter head adjustable to turn rods of all diameters from ¼" to 2" in either plain, spiral groove, longitudinal groove, or imitation reed wind. Special machine for turning rods of larger size.

Cutter-head mandrel is mounted at each end in ball-bearings of the highest grade.

Out-going feed rolls have combination of grooves so that many sizes can be made without changing feed rolls. The in-going feed rolls are adjustable for all sizes of squares.

Will work stock as short as 4½ inches.

Furnished with countershaft or motor drive.



Dowel Cutting Off and Pointing Machine

This machine is for cutting off and pointing dowel pins from long rods.

It will cut and point dowel pins of all diameters up to ¾", and in any length up to 6 inches.

Capacity of this machine is from 300 to 400 pins a minute. Any boy can operate it.

All working parts are completely enclosed and thus protected from dust and dirt.

Absolutely no danger to operator.

The floor space required by this machine is only 22" x 36".

Tight and loose pulleys on machine.

Furnished with belt or motor drive.

MANUFACTURED BY

The Bell Machine Company

(Successors to the Dauber-Bell Machine Co.)

Oshkosh, Wisconsin, U.S.A.

Representatives:

For Great Britain: THE OLIVER MACHINERY CO., 201 Deansgate, Manchester, England

For Canada: THE A. R. WILLIAMS MACHINERY CO. LTD., Montreal, Toronto, Winnipeg

It Pays to Use the Best Table Slides

A table slide that refuses to work properly is a source of continual annoyance to the customer. You can avoid it by using the famous Roller-Bearing Equalizer Slides.

Write us for Prices.

Watertown Table-Slide Company

Watertown, Wisconsin U.S.A.

MILL PIPING

Shaving and Sawdust Collecting Systems Installed Complete

ALTERATIONS—REPAIRS

Neville-Cooper Co.
130 Ontario St. Toronto
Phone Main 2157

We also manufacture and erect Smoke Stacks, Boiler Breechings, Metal Cornices, Skylights, Eavetrough, etc.

"Casco" for a better product

WATERPROOF GLUE
For Jointing and Veneering

STRONG - UNIFORM
USED COLD - EASILY PREPARED
ECONOMICAL

"CASCO" Uniformity is assured because we manufacture our own Casein. : : :

The Casein Manufacturing Company
Largest and Longest Established Manufacturers of Casein Products in America : : :
15 PARK ROW, - NEW YORK CITY

Write for "CASCO" Red Book—a manual on Veneers, Panel-Making and Glue.

Samples of "CASCO" on request.

Canadian Distributors
HART & LEFEBER, LTD.
38 Grey Nun, Montreal' Que.

FACTORY TRUCKS

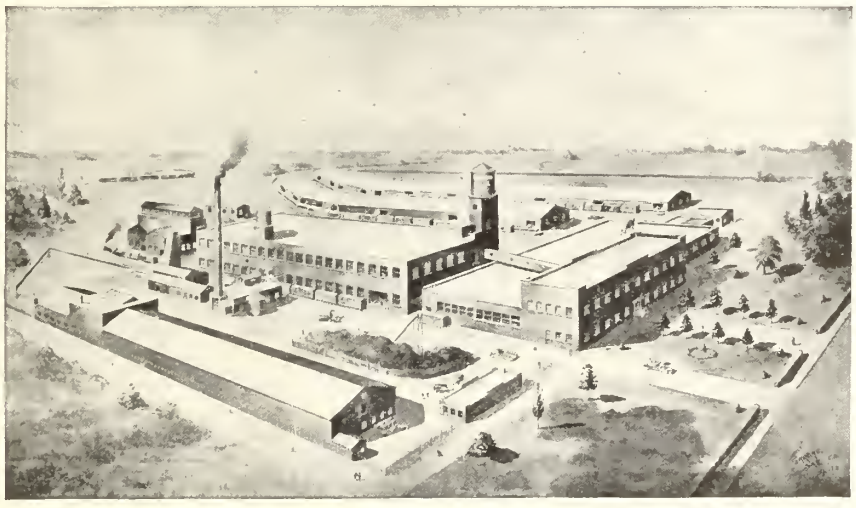
Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY

P. E. SHANTZ, PRESTON, ONTARIO.

Factory Truck Style No. 26.

PERKINS
183
Trade Mark
Reg. U.S. Pat. Off.



General Office and Factory

Same Glue
Same Service
Same Guarantee

DEPENDABLE

Good glue is a vital necessity in the manufacture of any product having glue in its make up. To be good it must be dependable every day in the year. **Perkins Vegetable Glue** is dependable because every pound of material that enters into its make up is carefully inspected and the finished product is uniform in quality.

Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Offices:
South Bend, Indiana

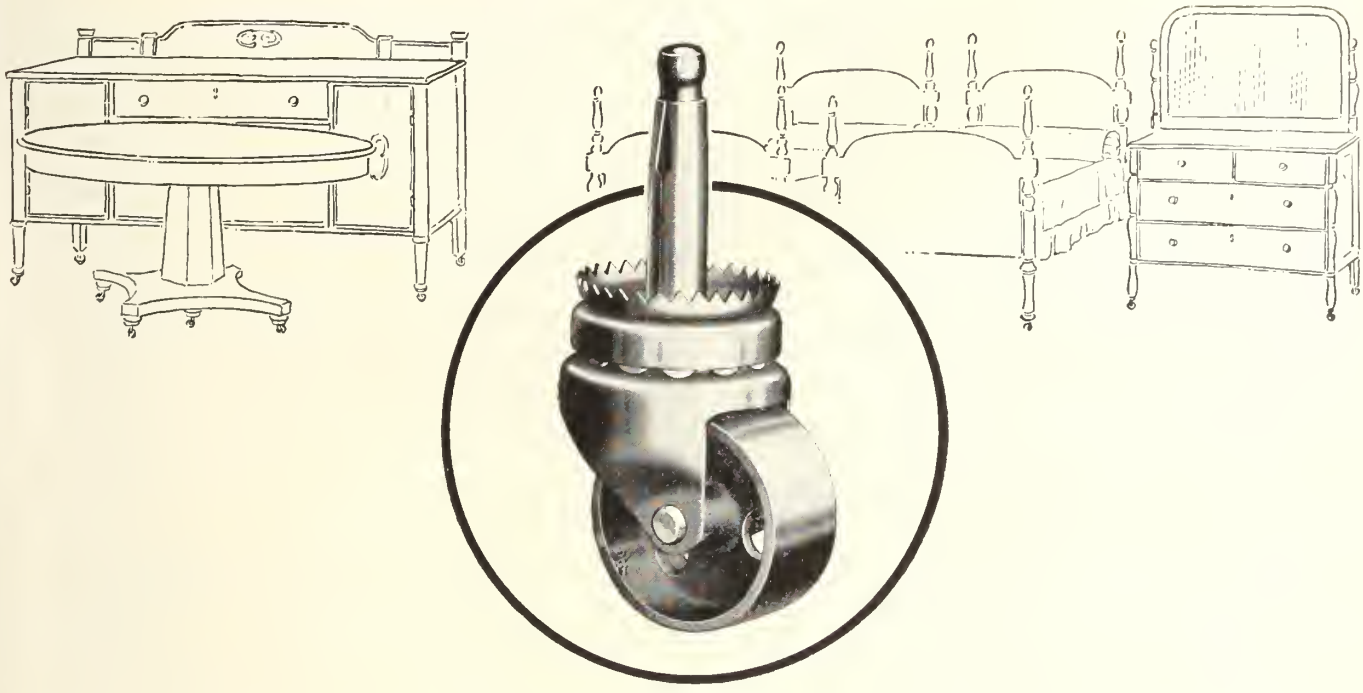
A great many new designs, the result of our late President's visit to Europe, will be added to our line. New illustrations of this addition will be ready for the mail in the course of another sixty days.

Our aim is to supersede all others in our line of manufacture, in quality, design and service. An organization is in the course of construction, that we hope will be the fulfilment of the ideal of the founder of our business, and be a monument to his memory.

Suggestions and enquiries are always gratefully received. Your co-operation and confidence is appreciated

JOHN WALTER & SONS LIMITED

KITCHENER :-: ONTARIO



Hundred Per Cent Furniture Includes Good Casters

— good ones like **Efemco** Casters.

— good ones that roll easily, and that never jam or bind.

— good ones that keep on giving A-1 service after years of hard, steady use.

Efemco Casters on furniture is the result of the manufacturer and the dealer making the most of an opportunity to give maximum service.

Write to-day for the Efemco Catalog of better casters.

Acme Grip Neck and Plate Casters
Acme Roller Bearing Casters
Atlas Plate Roller Bearing Casters

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters

Roller Bearing Casters
Truck Casters
Automobile Accessories

Piston Rings
Grey Iron Castings

Standardized by 56 years of service.

Corner posts and end of an Egyptian Mummy-case now in the Berlin Museum—2700 years old.

MONITE WATERPROOF GLUE, the modern scientific perfection of ancient casein glue, surpasses the glue of Egypt just as the modern steel and aluminum automobile excels the clumsy cedar and bronze chariot of the Pharaons.

Panels and Glue-Joints 3,000 Years Old!

The following is translated from pp. 56-7 of "The Story of Furniture" ("Geschichte des Mobels") by A. Koeppen and C. Breuer, published at Berlin in 1904.

"The Ancient Egyptians already employed the art of ennobling an ordinary wood by gluing on thin layers of costly woods. For example, the corner posts of a large mummy-case now in the Berlin Museum are overlaid with a veneer almost one centimeter thick—as can clearly be seen where a small part of the veneer is broken off."

"To bind together smoothened wood surfaces, the Egyptians used, even as it is customary today, curd glue, a mixture of casein and caustic lime—which glue has the advantage of being insoluble in water."

Egyptian furniture, jewel caskets and coffins taken from ancient tombs to modern museums, prove that the Egyptians used waterproof glues made from casein at least 3,000 years ago! Many specimens of glue-joined furniture, veneers and inlaid work of precious metals, ivory and rare woods, **made with casein waterproof glue, are still in excellent condition after 30 centuries.**

Glue joints and panels made today with **Monite Waterproof Glue,** the modern scientific perfection of the waterproof casein glue used by the Egyptians, will endure for centuries.

Monite Waterproof Glue costs but little more than vegetable glues, is as strong as the best hot glue, is mixed and applied by machinery or by hand, requires clamps for only 3 or 4 hours, **glues wood with high or low moisture content, is mixed and used cold produces panels and joints that are heat and water proof.**

Canadian Representatives
W. H. Cunningham & Hill, Ltd.
Toronto, Ontario.

Let us send you a small sample panel made with Monite for you to test by boiling, soaking and baking. Write for the panel and our printed matter NOW.

MONITE WATERPROOF GLUE CO.

Manufacturers of Cold Glue in Powdered Form

1628 No. 2nd St. Minneapolis, Minn. Representatives in all principal Cities

British Columbia Lumber Commissioner

Display rooms and offices have been removed to 51 YONGE STREET (Ground floor)

where a complete display of British Columbia forest products will be installed, including several rooms to full scale, finished in BRITISH COLUMBIA WOODS and completely furnished, showing exterior walls and roof of British Columbia red cedar with thatched roof effect. Also, a complete display of every grade of all British Columbia woods in commercial sizes and a complete line of British Columbia boxes and RED CEDAR SHINGLES.

You are cordially invited to call and see our exhibit.

Main 6872 TORONTO 51 Yonge St.

CHRISTOPHER COLUMBUS, contrary to the advice of all his friends, in the fifteenth century set out on a journey for the wonderful west and discovered America, then an unknown country.

Why do you not therefore let us have some of your business? Then you will have discovered a new source of supply, unsurpassed as to quality and service and at prices absolutely in keeping with the character of merchandise furnished.

In after years we think you will look back on this with as much satisfaction as did Chris' followers on his achievements.

R. R. May Hardwood Co.
1522 South Sixth St.
Louisville, :-: Kentucky

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

DRY STOCK

For Immediate Shipment

SOFT ELM		
6905′	1″	—No. 1 C&B
3195′	1″	—No. 2 Com.
41030′	1½″	—No. 1 C&B
2356′	1½″	—No. 2 Com.
56880′	2″	—No. 1 C&B
10046′	2″	—No. 2 Com.
110594′	2½″	—No. 1 C&B
26985′	2½″	—No. 2 Com.
11750′	3″	—No. 2 Com.
WHITE ASH		
87846′	2″	—No. 1 C&B
3072′	2″	—No. 2 Com.
139960′	2½″	—No. 1 C&B
13537′	2½″	—No. 2 Com.
18992′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.
HICKORY		
650′	1″	—No. 1 C&B
1408′	2″	—No. 1 C&B
COTTONWOOD		
1620′	1″	—No. 1 C&B
19956′	2″	—No. 1 C&B
1196′	2″	—No. 2 Com.
BLACK WALNUT		
2873′	1″	—No. 1 C&B
1151′	1″	—No. 2 Com.
WILLOW		
1446′	1″	—No. 1 C&B
CHERRY		
4747′	1″	—No. 1 C&B
2137′	1″	—No. 2 Com.
ROCK ELM		
12493′	2″	—No. 1 C&B
SOFT MAPLE		
14397′	2½″	—No. 1 C&B
BASSWOOD		
1549′	1″	—No. 1 C&B
606′	2″	—No. 1 C&B
BUTTERNUT		
2584′	1″	—No. 1 C&B
HARD MAPLE		
31788′	1″	—No. 1 C&B
243927′	1¼″	—No. 1 C&B
227707′	1½″	—No. 1 C&B
1796′	1½″	—No. 2 Com.
217401′	2″	—No. 1 C&B
11410′	2″	—No. 2 Com.
38016′	2½″	—No. 1 C&B
11091′	3″	—No. 1 C&B
2796′	4″	—No. 1 C&B
BEECH		
3000′	1½″	—No. 2 Com
500′	2″	—Log run
250′	2½″	—Log run
350′	3″	—Log Run
100′	4″	—Log run
BIRCH		
15998′	1″	—No. 1 C&B
22311′	1¼″	—No. 1 C&B
11748′	1½″	—No. 1 C&B
50157′	2″	—No. 1 C&B
87172′	2½″	—No. 1 C&B
7866′	3″	—No. 1 C&B
PLAIN OAK		
9369′	1″	—No. 1 C&B
1107′	2″	—No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Ply Wood Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVENUE : : TORONTO

Full or mixed cars for immediate delivery

HARD and SOFT MAPLE **ROCK and SOFT ELM**
BEECH **BIRCH** **and BASSWOOD**

Hardwoods in 4 x 4, 4 x 6, 1″ and 2″. No. 3 Common.

Why not get in touch with us?

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

AMERICAN WALNUT

"The Cabinet-wood of the Ages"

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

In Constant Demand

Every maker of furniture, interior trim and cabinet work knows that there are times of "craze" for particular kinds of wood—periods of "peak" demands for certain varieties.

These swings of popular taste go from wood to wood, with more or less regularity. But you never saw a time when there was not a steady, regular demand for Walnut furniture of the better class, did you?

Isn't that the best evidence that whatever you make in "Reel American Walnut" is certain of a ready sale?

Partly from tradition and history and partly because of our nationl advertising, there are more people who appreciate the values in Walnut and are demanding its use than ever before. You never have any trouble in selling anything that you make from "Real American Walnut," because the **value** of it is readily recognized and fully appreciated. Real Walnut is always a "sure fire" seller.

You will find some valuable marketing data in our Walnut Book.
We will gladly send you a copy without charge or obligation.

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO, U. S. A.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft.....8/4 No. 1 Com.

Band-mills at Baton Rouge, La., Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

SAM D. SMITH

Wholesale Dealer and Manufacturer in

NORTHERN and SOUTHERN HARDWOODS

305 Kent Building, Toronto

Specialty—Sawing Dimenison Stock to Order

H. J. RICHARDS J. T. KENDALL

Richards Hardwood Company

746-7 BANK OF COMMERCE BUILDING

Memphis, Tennessee, U. S. A.

Successors to Dacus-Richards Hardwood Co.

We make a specialty of catering to the Canadian trade and are in position to make reasonably prompt shipment of practically any Southern Hardwoods which you are needing. Your orders and inquiries will be highly appreciated and will receive our prompt and personal attention.

Specializing in Delta Red and Sapgum, Oak, Elm and Poplar.

"Quality Lumber guarantees value received"

We Especially Invite Orders, on the Following Stock:

20,000′	4/4″	Fas Plain White	$117.00 per M′
50,000′	4/4″	No. 1 Com & Sel	70.00 per M′
20,000′	4/4″	Fas Plain Red Oak	115.00 per M′
50,000′	4/4″	No. 1 Com & Sel same	63.50 per M′

These prices are f.o.b. Toronto rate, and we will protect same until May 10, 1922.
In addition to the above, we have a desirable stock of Gum, both Red and Sap, and invite your correspondence.

GENERAL HARDWOOD LUMBER COMPANY

118 North La Salle Street - - - - - CHICAGO, ILL.

Miller Lumber Company

Marianna - Arkansas

QUARTERED WHITE OAK
300,000′ 4/4 No. 1 Com.
20,000′ 5/4 No. 1 Com.
8,000′ 8/4 No. 1 Com.
150,000′ 4/4 No. 2 Com.
2,000′ 5/4 No. 2 Com.

PLAIN WHITE OAK
70,000′ 4/4 FAS
13,500′ 5/4 FAS
300,000′ 4/4 No. 1 Com.
42,000′ 6/4 No. 1 Com.
35,000′ 8/4 No. 1 Com.
300,000′ 4/4 No. 2 Com.
11,500′ 5/4 No. 2 Com.
10,500′ 6/4 No. 2 Com.
20,000′ 8/4 No. 2

QUARTERED RED OAK
3,200′ 3/4 C & Btr.
150,000′ 4/4 Nos. 1 & 2 Com.
1,000′ 5/4 No. 2 C & Btr.
3,500′ 8/4 No. 2 C & Btr.

PLAIN RED OAK
75,000′ 4/4 FAS
13,500′ 5/4 FAS
5,000′ 8/4 FAS
600,000′ 4/4 No. 1 Com.
33,000′ 5/4 No. 1 Com.
11,000′ 6/4 No. 1 Com.
48,000′ 8/4 No. 1 Com.
600,000′ 4/4 No. 2 Com.
9,400′ 5/4 No. 2 Com.
3,000′ 8/4 No. 2 Com.

MISCELLANEOUS OAK
3,700′ 3/4 No. 2 C & B Qt. W. O.
5,000′ 4/4 Cl. Pl. RO Stps 3-5 1/2″
8,500′ 4/4 Cl. Pl. WO Stps 3-5 1/2″
7,300′ 5/4 Pl. RO Step Plk. 11″ & Wdr
5,500′ 3/4 No. 2 C & B Pl. R & WO.
160,000′ 4/4 S.W. R & WO.
300,000′ 4/4 No. 3 Com.
20,000′ 5/4 No. 3 Com.
22,000′ 6/4 No. 3 Com.
12,000′ 8/4 No. 3 Com.
50,000′ 8/4 Bridge Plk. R & W
50,000′ 10/4 " " " fwd.
200,000′ 12/4 " " "

SYCAMORE
130,000′ 4/4 No. 2 C & B Qtd.
1,000′ 5/4 No. 2 C & B Qtd.
400,000′ 4/4 No. 1 C & B

QUARTERED RED GUM
25,000′ 5/4 No. 1 C & Btr.
15,000′ 6/4 No. 1 C & Btr.

PLAIN RED GUM
1,100′ 5/8 FAS
1,800′ 3/4 No. 2 C & Btr.
40,000′ 4/4 No. 2 Com.
3,300′ 8/4 No. 2 C & Btr.

SAP GUM
4,200′ 4/4 Pnl & No. 1 18″ & Up
50,000′ 4/4 Clr strips 3-5 1/2″
20,000′ 4/4 No. 1 C stps 2-5 1/2″
125,000′ 4/4 Box Bds. 9-12″
150,000′ 4/4 Box Bds. 13-17″
6,500′ 5/4 No. 1 Com.
50,000′ 6/4 No. 1 C & Btr.
6,000′ 8/4 No. 1 C & Btr. Qtd.
9,500′ 8/4 No. 1 C & Btr. Qtd. Stps

TUPELO
50,000′ 4/4 FAS 6-12″
5,000′ 4/4 FAS 13-17″
5,000′ 4/4 No. 1 Com. 13-17″
12,500′ 4/4 Box Bds. 9-12″
3,700′ 4/4 Box Bds. 13-17″

COTTONWOOD
100,000′ 4/4 FAS 6-12
30,000′ 4/4 FAS 13-17″
15,000′ 4/4 pnl & No. 1 18″ & Up
40,000′ 4/4 Box Bds. 9-12″
30,000′ 4/4 Box Bds. 13-17″
150,000′ 4/4 No. 1 Com.
100,000′ 4/4 No. 2 Com.

MAPLE
40,000 4/4 No. 2 C & Btr.
50,000′ 5/4 No. 2 C & Btr.
75,000′ 6/4 No. 2 C & Btr.
20,000′ 10/4 No. 2 C & Btr

CYPRESS
20,000′ 4/4 FAS
9,000′ 5/4 FAS
10,700′ 6/4 FAS
20,000′ 8/4 FAS
250,000′ 4/4 No. 1 Shop
15,000′ 8/4 No. 1 Shop
30,000′ 5/4 No. 1 Com.

Thomas & Proetz Lumber Co.

3406 N. Hall St.

ST. LOUIS, MO.

BELZONI, MISS. —— MILLS —— CALION, ARK.

Com. & Btr. Quartered White Oak
1″ —925,000 ft.
1¼″—335,000 "
1½″—115,000 "

Com & Btr. Quartered Red Oak
1″ —380,000 ft.
1¼″—150,000 "
1½″—275,000 "

Com. & Btr. Plain Red Oak
1″ —150,000 ft.

Com. & Btr. Plain White Oak
1″ —150,000 ft.
1½″—250,000 "

Com & Btr. Red Gum Plain & Quartered
1¼″—300,000 ft.
2″ —500,000 "
2½″—235,000 "
3″ —180,000 "

Com. & Btr. Sap Gum
1″ —350,000 ft.
1¼″—433,000 "
1½″—750,000 "
2″ —980,000 "
2½″—170,000 "
3″ —350,000 "

Com. & Btr. Quartered Black Gum
1″ —290,000 ft.

Com. & Btr. Tupelo
1″ —235,000 "

Chapman & Dewey Lumber Co.

Memphis Tennessee

Operating Modern Band Mills in the St Francis Basin

OFFER

7 cars 5/4" No. 1 Common Sap Gum
7 cars 8 4" FAS Sap Gum
4 cars 8 4" No. 1 Common Sap Gum
3 cars 6 4" No. 1 Common Btr. qtd. Red Gum S.N.D.
4 cars 8 4" No. 1 Common Btr. qtd. Red Gum S.N.D.
3 cars 4 4" No. 1 Common Plain qtd. Red Gum S.N.D.
7 cars 4 4" x 9-12" Cotton Box Boards
7 cars 4 4" x 13-17" Cotton Box Boards
7 cars 4 4" x 6-12" FAS Cottonwood
7 cars 4 4" x 10-13" " "
7 cars 4 4" x 13-17" " "
15 cars 4/4" No. 1 Common "
10 cars 4 4" No. 1 C&B. White Ash
10 cars 5/4" No. 2 & No. 3 Com.
3 cars 8/4" No. 1 C&B.
5 cars 8/4" Log Run Maple
10 cars 10/4" Log Run Maple
10 cars 4/4" No. 1 C&B. Sycamore
20 cars 4/4" No. 2 & No. 3 Com. Sycamore
15 cars 4/4" No. 1 Com. Cypress
7 cars 5/4" No. 1 " "
5 cars 6/4" No. 1 " "

Delivery Prices Furnished on Request

McDonagh Lumber Co.

203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods

Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

FOR IMMEDIATE SHIPMENT

10 cars 4/4 No. 2 C & B. Birch
4 cars 5/4 No. 1 C & B. Birch
5 cars 6/4 No. 1 C & B. Birch
7 cars 8/4 No. 1 C & B. Birch
2 cars 10/4 No.1 C & B. Birch
3 cars 12/4 No. 1 C. & B. Birch
3 cars 16/4 No. 1 C & B. Birch
4 cars 8/4 No. 2 & No. 3 Com. Birch
20,000 ft. 4/4, 5/4, 6/4, mostly 4/4 and 5/4 Canadian Cherry No. 1 C & B. 6/14 inches wide.
40,000 ft. 4/4 No. 1 C & B. Basswood
30,000 ft. 6/4 FAS. Maple, very choice stock
400,000 ft. 1 x 3 and up Spruce Crating
200,000 ft. 2 x 3 and up Spruce Crating
400,000 ft. 5/8 x 3 and up Spruce Crating

Write, Wire or Phone Inquiries

PERCY E. HEENEY

Office: 298 Breithaupt St., KITCHENER, ONT.

Calhoun Plywood Company

Panels Tops Counter Fronts

OPERA CHAIRS
in the White or finished.

Vegetable or Waterproof Glue.

Sheboygan - Wisconsin

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	0/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

On hand for immediate shipment

Furniture dimension, Clear Red gum squares,	2 cars	2½ x 2½-30" D
	1 car	2 x 2 2½ x 2½-19" M
Clear Sap Gum squares,	1 car	2 x 2 -19" D
	2 cars	2 x 2 -30" D
	2 cars	2½ x 2½-30" D
Clear Wh. & Red Oak,	2 cars	2 x 2 -19" M
	2 cars	2 x 2 -30" D
	1 car	1½ x 1½-19" D
Clear ASH	1 car	1¾ x 1¾ 2 x 2 -38, 44 & 50" D
	1 car	1-1/8 x 1-1 8 7' D
	1 car	2½ x 2½-30"
	1 car	1-5/8 x 1-5/8-36, 40" D
	1 car	1-5/8 x 1-5/8-19 to 34" D
Hardwood lumber 1 car		5/4 No. 1 Com. & Btr. Qrtd. Red Gum
	1 car	4/4 FAS Plain Sap Gum
	2 cars	4/4 No. 1 Com. Plain Sap Gum
	1 car	4/4 No. 1 Com Plain White & Red Oak
	1 car	4/4 No. 1 Com. Plain Red Oak
	2 cars	4/4 FAS Cottonwood
	1 car	4/4 Sound Wormy Oak
	1 car	4/4 Log Run Soft Elm
	1 car	6/4 Log Run Soft Elm
	1	14/4 Log Run Soft Elm

D-Dry M-Partly dry. G-Green

We can furnish your requirements in square or flat dimension. Let us have your specifications.

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office Dimension Mill & Yard
Belt Line at McLean.

MEMPHIS - TENN.

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

Southern Hardwoods

GUM - POPLAR - OAK

We take a just pride in turning out the very best lumber for the manufacture of high grade furniture.

A modern mill, experienced operators and rigid grading of the finished lumber is your guarantee of assured satisfaction.

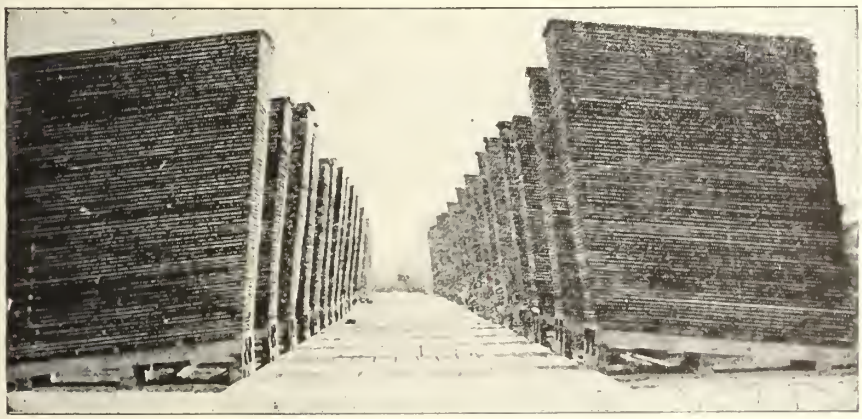
Test Our Service

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY Memphis - Tennessee SERVICE

Efficiency Marks Every Step of Our Service to You



Exact photograph of alley in our yard

White and Red Oak

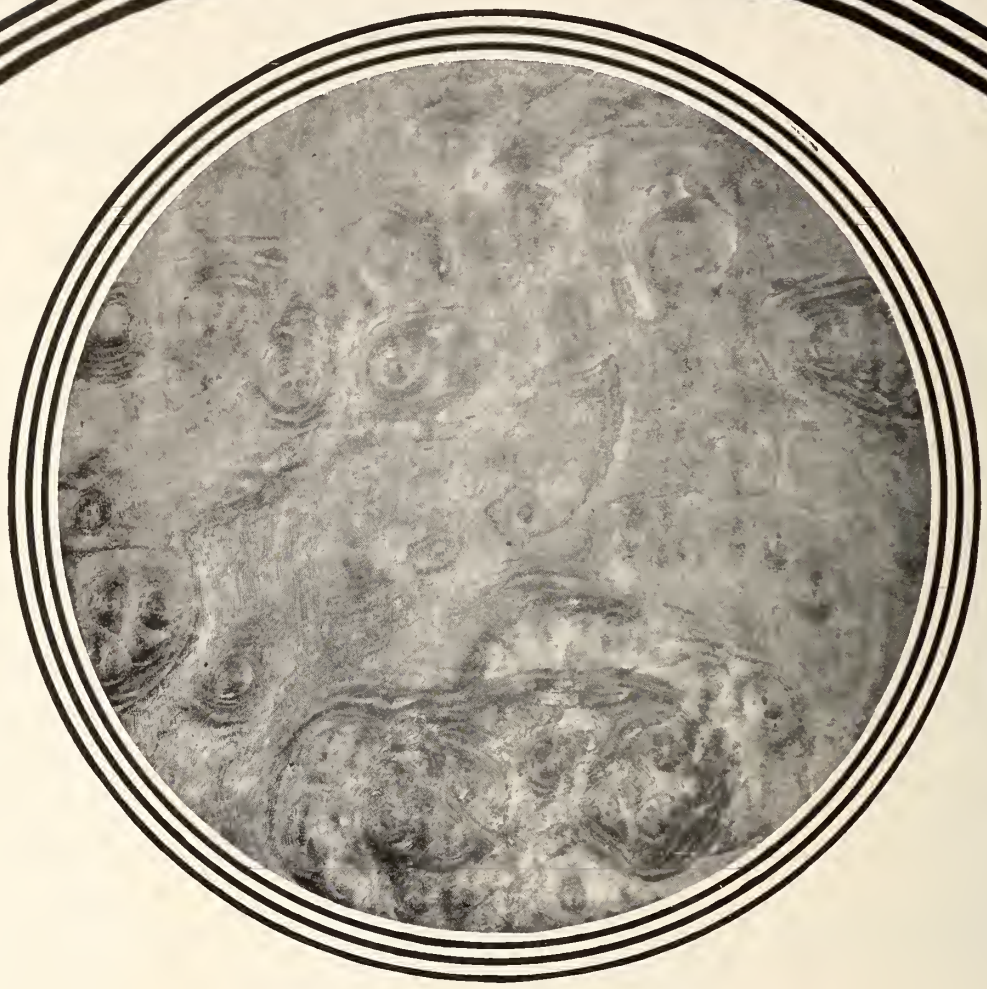
Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO



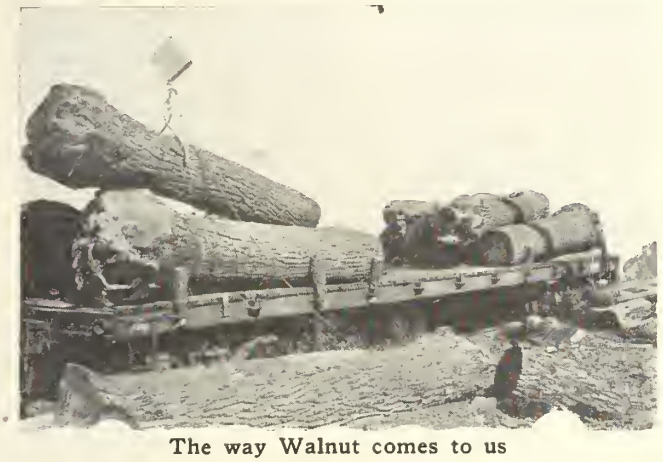
IOWA
WALNUT

Grown in the deep, rich, black loam of Iowa's river valleys, buffeted by the stress and strain of her winds and changing climate, walnut grown in Iowa has developed a strength, fineness, and beauty of marking that experts declare is equaled by no other walnut. Only the finest of Iowa grown walnut trees are used in cutting IOWA WALNUT.

If you need Walnut lumber or veneers let us send you some further evidence of the quality of Iowa Walnut and quotations on some unusually fine lots now available.

Des Moines Sawmill Company
1023 Murphy Street
Des Moires, Iowa

"Hartzell's Choice Walnut"



The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

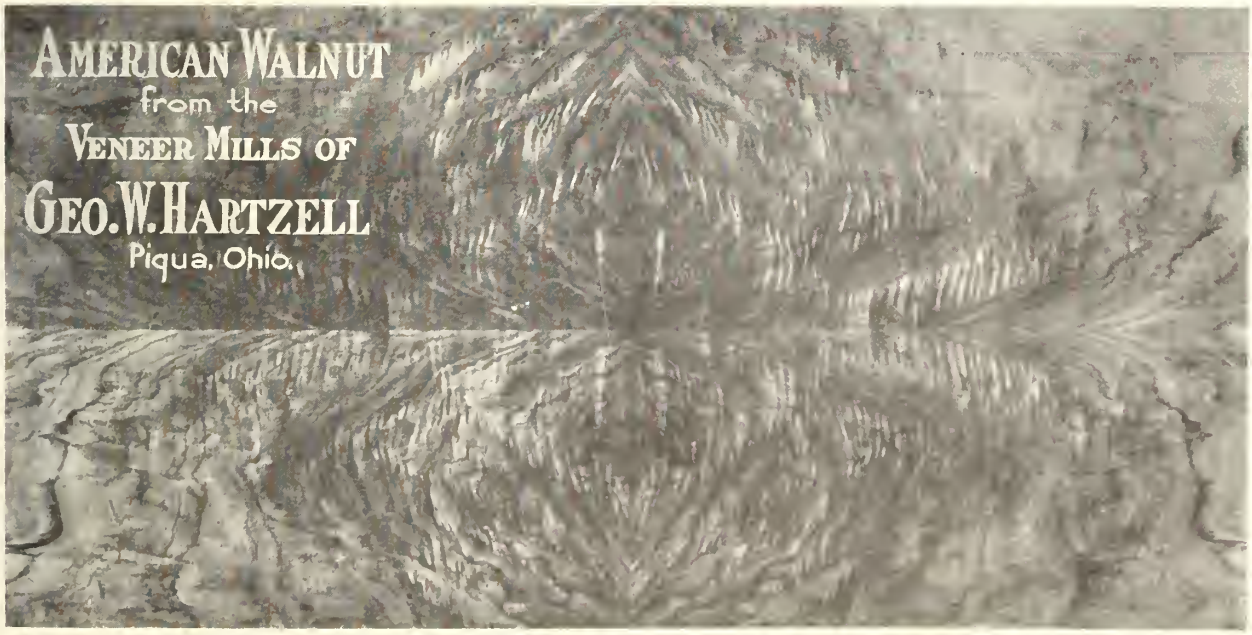
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manu facture.

Oak Timbers and Planking

The **Mowbray & Robinson Co.**
(INCORPORATED)
Manufacturers
Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative:
A. K. Johnson, Traders Bank Building, Toronto, Ont

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE
Kansas City - Kansas

E L M M A P L E

FOR SALE **RUSH LUMBER COMPANY** *FOR SALE*

QTD. WHITE OAK				4-4	Sound Wormy .	25,000′
4-4	F. A. S.	2,000′		4-4	No. 3 Com.	70,000′
4-4	F. A. S. 10″ & up	1,000′		5-4	F. A. S.	2,000′
4-4	No. 1 Com.	15,000′		5-4	No. 2 Com.	13,000′
4-4	No. 2 Com.	15,000′		6-4	No. 1 Com.	2,000′
5-4	F. A. S.	14,000′		PLAIN RED OAK		
5-4	No. 1 Com.	8,000′		3-4	No. 1 & 2 Com.	70,000′
5-4	No. 2 Com.	4,000′		4-4	F. A. S.	2,000′
6-4	No. 1 Com.	30,000′		4-4	No. 1 Com.	10,000′
6-4	No. 2 Com.	20,000′		4-4	No. 2 Com.	20,000′
8-4	F. A. S.	5,000′		5-4	F. A. S.	7,000′
8-4	No. 1 Com.	3,000′		5-4	No. 1 Com.	15,000′
PLAIN WHITE OAK				5-4	No. 2 Com.	3,000′
4-4	No. 1 Com.	5,000′		QTD. RED GUM		
4-4	No. 2 Com	8,000′		4-4	F. A. S.	7,000′

G U M O A K

4-4	No. 1 Com.	13,000′		POPLAR		
5-4	F. A. S.	2,000′		4-4	No. 2 A Com. ..	25,000′
6-4	F. A. S.	3,000′		4-4	No. 2 B Com. ..	35,000′
6-4	No. 1 Com.	14,000′		5-4	Sel. & Bet.	9,000′
RED GUM S. N. D.				5-4	Saps	3,000′
8-4	No. 1 C&B. ...	70,000′		5-4	No. 1 Com.	12,000′
10-4	No. 1 C&B. ...	40,000′		5-4	No. 2 A Com. ..	8,000′
SAP GUM				6-4	Sel. & Bet.	7,000′
5-8	No. 2 Com.	7,000′		6-4	No. 2 Com.	12,000′
5-4	F. A. S.	1,000′		8-4	Sel.	3,500′
5-4	F.A.S. 13″ & Up	4,000′		8-4	Sap	8,000′
5-4	No. 1 Com.	9,000′		8-4	No. 1 Com.	3,000′
6-4	F. A. S.	11,000′		MISCELLANEOUS		
6-4	No. 1 Com.	6,000′		4-4	L. R. Qtd. B. Gum	25,000′
6-4	No. 2 Com.	4,000′		4-4	L. R. Pln. B. Gum	25,000′

A S H P O P L A R

MEMPHIS, TENN.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

Mills: Coal Grove, Ohio

General Offices: 33 Rector St. New York City

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. Submit your enquiries to our Sales office, Cincinnati, Ohio

WAYNE LUMBER CO.

Manufacturers and Wholesalers

American and Canadian
Hardwoods

Birch and Maple—Our Specialty

Special items we want to move:
1 car 2″ Basswood Log Run
Soft Elm, 70,000′ 1″ Log Run
Soft Elm, 70,000′ 2″ Log Run
Soft Elm, 24,000′ 3″ Log Run
1 car 5/4 No. 2 Com. Maple
2 cars 2″ No. 1 Com. & No. 2 Com. Maple

110 West 40th St. New York

Canadian Representative,
D. Cote, 730A Champagneur, Outremont, Montreal

BEDNA YOUNG
Lumber Company

Jackson - Tennessee

Manufacturer of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for
High Grade Lumber
please let us have your enquiries.

HARDWOOD LUMBER

"A Quality you will admire"

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Kiln Dried Products

Our kiln at Owensboro is a thoroughly modern equipment for handling green or dry lumber with efficiency and entire satisfaction.

Our facilities enable us to give real service—straight or mixed carloads.

Try our soft textured and finely figured quartered-sawn red and white oak. It will please you.

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills Owensboro; Campbellsville, Kentucky

D. E. Hewit
Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated **General Office, NEW ORLEANS, U.S.A**

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

MILLS AT EVANSVILLE, IND., GRAMMER, IND., and KEIRNS, MISS.

STOCK LIST ENCLOSED

PLAIN SAP GUM

10,000 ft. 5/8 in. 1 & 2
25,000 " 1 " "
15,000 " 1¼ " "
13,000 " 1¼ " 15" to 17"
71,000 " 1½ " "
11,000 " 2 " "
13,000 " 1 " Box Boards 13 to17"
102,000 " 5/8 " No. 1 Common
80,000 " 1 " No. 1 "
24,000 " 1¼ " No. 1 "
77,000 " 1½ " No. 1 "
52,000 " 2 " No. 1 "
20,000 " 1 " No. 2 Common
10,000 " 1½ " No. 2 "

QUARTERED RED GUM
(Sap no Defect)

10,000 ft. 1¼ in. 1 & 2
4,000 " 1½ " "
65,000 " 2 " "
83,000 " 2½ " No. 1 C&B.
227,000 " 3 " No. 1 C&B.
13,000 " 1 " No. 1 Common
119,000 " 1¼ " No. 1 "
40,000 " 1½ " No. 1 "
143,000 " 2 " No. 1 "

QUARTERED WHITE OAK

154,300 ft. ½ to 2½ in. 1 & 2
73,000 " 1 in. No. 1 Com. 1½ to 2½"
114,000 " ½ & 5/8 in. No. 1 Com.
101,000 " ¾ in. No. 1 Com.
268,000 " 1 " No. 1 "
202,000 " 1¼, 1½ & 2" No. 1 Com.
124,000 " 1, 1¼ & 1½" No. 2 Com.
4,900 " 3 to 4 in. No. 1 C&B.
75,000 " 1 in. Clear Strips, 2½ to 5½ in.
25,000 " 1 in. Clear Sap, 2 to 3 in.

QUARTERED RED OAK

29,000 ft. ½ & 5/8 in. 1 & 2
115,000 " 1, 1¼, 1½, 1¾ & 2 in. 1 & 2
43,700 " 1 to 2 in. 1 & 2, 9" & up
117,400 " 5/8 to 1½ in. No. 1 Com.
15,000 " 1 in. No. 1 Com. Stps., 1½ to 3'
20,000 " 1 in. Clear Strips, 2 to 5½ in.
26,000 " 1, 1¼ & 1½ in. No. 2 Common.

PLAIN WHITE OAK

27,200 ft. 1, 1¼, 1½ & 2½ in. 1 & 2
11,000 " 2½ in. No. 1 C&B
218,000 " 5/8 & 2½ in. No. 1 Com.
44,600 " 1 & 1¼ in. No. 2 Com.

PLAIN RED OAK

121,000 ft. 1 1¼, 1½, 2 & 2½ in. 1&2
10,000 " 2½ in. No. 1 C&B.
71,500 " ½, 5/8 & ¾ in No. 1 C.
246,000 " 1 to 2½ in. No. 1 Com.
101,200 " 1 1¼, 1½ & 2 in. No. 2 Com.
80,000 " 1 in. Sound Wormy Oak

PLAIN RED GUM

5,200 ft. 1½ in. 1 & 2
14,000 " 1 " No. 1 Common.
16,230 " 1¼ " No. 1 "
17,000 " 1½ " No. 1 "
16,000 " 1 " No. 2 "

QUARTERED RED GUM

3,000 ft. 1¼ in. 1 & 2
6,000 " 1¼ " No. 1 Common.
3,760 " 2 " No. 1 "
6,790 " 1½ " No. 1 "

ASH

63,000 ft. 5/8, 1, 1¼ & 1½" 1 & 2
8,000 " 1 in. 1 & 2, 10" & up
244,800 " 1½ to 5 in. No. 1 C&B
159,000 " 5/8, 1, 1¼, 1½ & 2 in. No. 1 Com.
120,000 " 5/8, 1, 1¼, 1½ & 2 in. No. 2 Com.

POPLAR

12,000 ft. 1 in. Box Bds., sap no defect. 12 in. & wdr.
70,000 " 1 & 1¼ in. 1 & 2, Yellow
35,000 " 5/8 in 1 & 2 sap no defect
115,000 " 1 to 3 in. 1 & 2 sap no "
18,000 " 5/8 in. 1 & 2, sap no " 12 in. & wdr.
12,000 " 1½ in. 1 & 2, sap no " 12 in. & wdr.
65,000 " 5/8 & ¾ in. No. 1 Com.
208,000 " 1 in. No. 1 Com.
117,000 " 1¼, 1½, 2 & 2½ in No. 1 Common.
25,300 " 5/8 & ¾ in. No. 2 Com.
172,000 " 1 in. No. 2 Com.
150,000 " 1¼, 1½ & 2 in. No. 2 C.

WALNUT

1,100 ft. ½ & 5/8 in. 1 & 2 & Sel.
19,900 " 1¼ to 4 in. 1 & 2 & Sel.
15,400 " ½ & 5/8 in. No. 1 Com.
33,500 " 1¼, 1½, 1¾ & 2 in. No. 1 Common.
21,800 " ½, 5/8, & ¾ in. No. 2 C.
28,800 " 1, 1¼, 1½ & 2 in. No. 2 Common.
16,000 " 5/8 in. Log Run.

TUPELO

45,000 ft. 1 in. 1 & 2
48,000 " 1 " Box Bds. 13 to 17"
1,000 " 1 " Panel 18 in. & up
3,185 " 1 " No. 1 Common

CYPRESS

22,384 ft. 2 in. 1 & 2
10,800 " 1 " Selects
9,020 " 2 " Select
6,000 " 1 " No. 1 Common
3,000 " 2 " No. 1 "
22,560 " 1 " No. 1 Shop
31,560 " 2 " No. 1 Shop
7,320 " 1 " No. 2 Common
3,720 " 2 " No. 2 Common

MISCELLANEOUS

106,000 ft. 1, 1¼, 1½ & 2 in. Qtd. Bl. Gum, No. 1 C&B
41,000 " 1 in. Black Gum, Log Run
120,000 " 1, 1½, 2 & 2½ in Hickory, L.R.
58,000 " 1 in. Basswood Log Run
163,000 " 1 to 3 in. Hard Maple Log Run
151,000 " 1 to 3 in. Soft Maple Log Run
248,000 " 1 to 4 in. Elm, Log Run
13,200 " 1 & 2 in Cherry Log Run
110,000 " 1, 1½ & 2 in Beech L.R.
142,000 " 5/8 to 2½ in. Pl. Sycamore, L.R.
87,400 " 5/8 1, & 2" Qtd. Syc.
40,000 " 2 in. Cypress, Shop & Better
116,000 " 1 in. Cypress Log Run.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

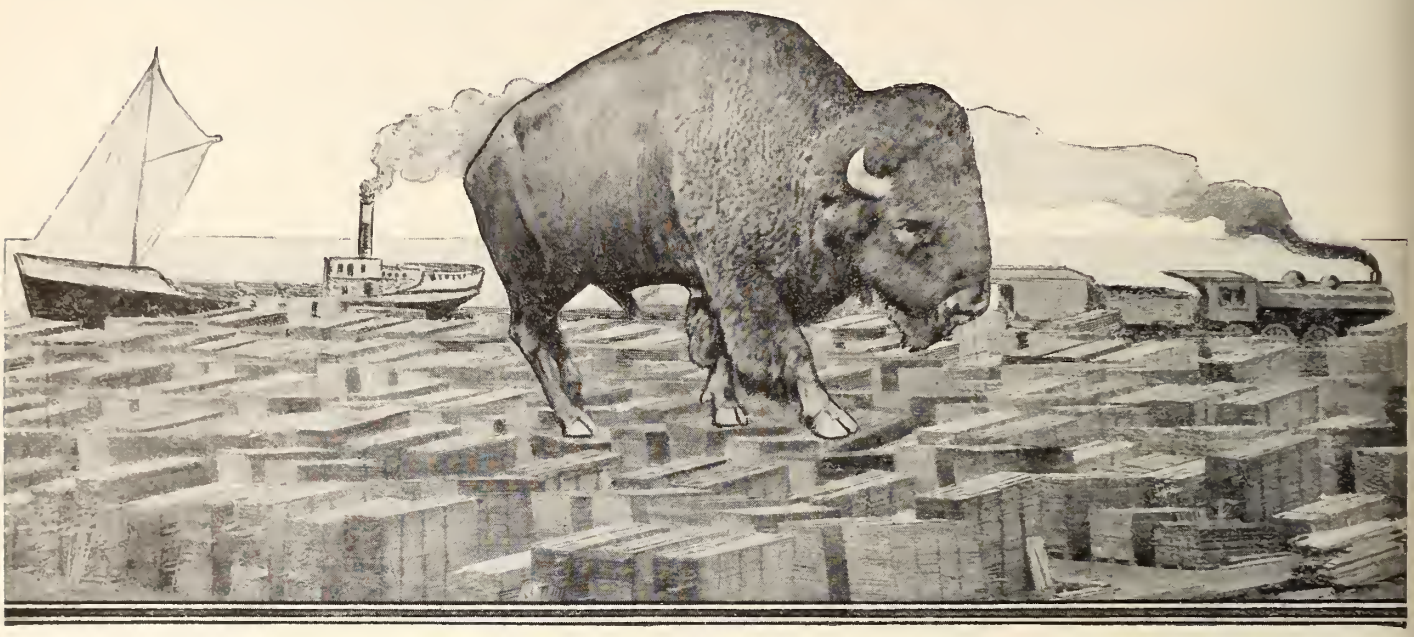
A few Specials :

130,000 ft. 4/4 No. 1 and No. 2 Common Qtrd. White Oak
65,000 ft. 4/4 No. 1 and No. 2 Common Plain White Oak
100,000 ft. 4/4 No. 1 and No. 2 Common Poplar

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Buffalo for Hardwoods



"LET BUFFALO DO IT"

Buy and Sell Your Hardwoods in Buffalo

Do you want prompt shipment? We can give you service. Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.

Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

Frank T. Sullivan
Specialities:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
Northern Grey Elm
and
Brown Ash
Niagara Street Cornor Arthur

ATLANTIC LUMBER COMPANY
HARDWOODS
West Virginia Soft Red and White Oak
Our Speciality: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller, Sturm & Miller
1142 Seneca Street
Hardwoods of All Kinds

YEAGER LUMBER CO., Inc.
SPECIALITIES
Oak, Poplar, Ash, Maple
932 Elk Street.

STANDARD HARDWOOD LUMBER COMPANY
HARDWOODS
Prompt Shipment { From Buffalo Yards or from mill direct to you
8 Million Feet Dry Stock on hand
1333 Clinton St.

G. Elias & BRO., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and fir timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B WALL Pres. T. H. WALL Vice-Pr.
M. M. WALL, Treasurer
940 SENECA ST.
We Specialize in White Ash, Oak, Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

HUGH McLEAN LUMBER CO.
Hardwoods of all Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

TAYLOR & CRATE
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

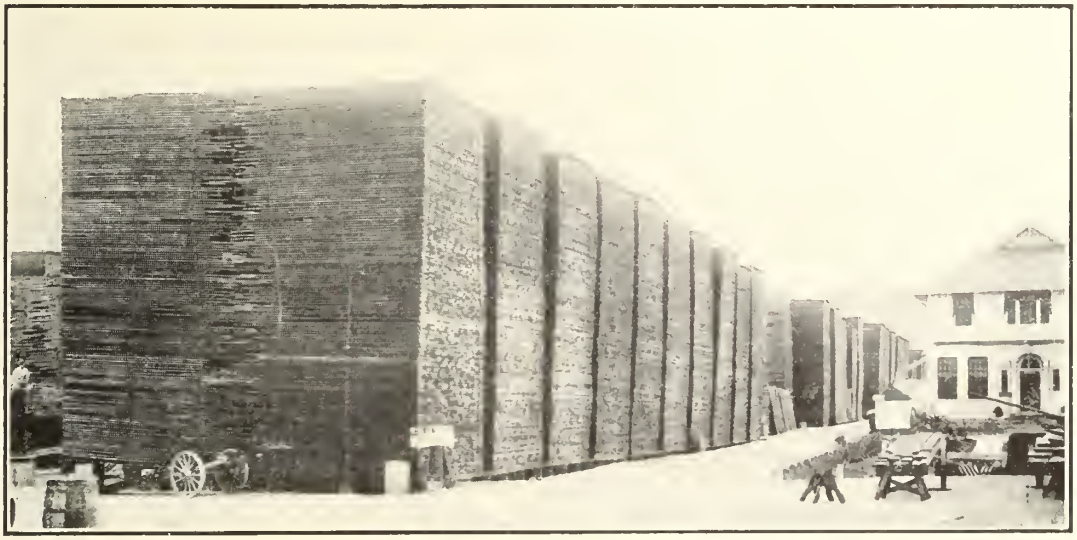
OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY



Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

Specialty E C & S Birch

Canada's Leading Manufacturers

use Northern Birch supplied by Edward Clark & Sons Limited

THE fine texture, the ease with which it works and the truly beautiful grain of this northern hardwood is well known to the manufacturers we serve.

An example of this is the pleasing Vanity Dresser, made by the Dominion Furniture Manufacturers Limited, St. Therese, Quebec.

Furniture of this type is getting its full share of present day business and is growing in popularity every year.

We can supply you with any quantity of Northern Birch expertly manufactured and graded to National Hardwood Lumber Association standards—at surprisingly low prices, quality considered.

Edward Clark & Sons, Limited

Manufacturers and Wholesalers of Northern Hardwood

807-9 Bank of Hamilton Bldg. Toronto

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES – that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

Lumber

Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers

Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut
Mahogany, Teak, Oak
Ash, Cypress

ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

The McLennan Lumber Co.
Limited

MONTREAL

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co. Limited

ORILLIA ONTARIO

Sawmills at Zebra and Orillia, Ont.

Cable Address: "Special," Orillia, Can

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.—58,000
1¼ in.— 3,500
1½ in.—

CHERRY

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
1 in.	44,500	.....	203,900	18,500
1¼ in	4,900	.....	37,600	7,500
1½ in.	2,000	.....	34,700	36,300
2 in.	6,000	.....	22,200	61,900
2½ in.	5,500	.....	4,300	2,200
3 in.	25,700	.....	6,500	3,300
4 in.	4,000	.....	900	400

CHESTNUT

	1 & 2	Clear Strips.	No. 1 Com.	S.W. & No. 2 Com.
¾ in.	500	.....	56,000	91,000
1 in.	11,000	500	45,000	1,000
1¼ in.	66,800	300	100,200	159,200
1½ in.	34,500	.....	40,000	.....
2 in.	2,200	.....	15,300	89,200
2½ in.	4,000	.....	1,500	.....
3 in.	1,100	.....	1,000	500
4 in.	1,500	.....	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
½ in.	6,500	.....	.....	.....
¾ in.	900	300	23,600	9,000
⅝ in.	2,800	.....	5,500	800
1 in.	17,300	10,000	52,400	27,000
1¼ in.	5,000	.....	6,000	.....
1½ in.	600	.....	2,400	.....
2 in.	.....	.....	25,100	5,700
2½ in.	2,000	.....	400	.....
3 in.	2,000	.....	1,300	.....
4 in.	2,500	.....	1,700	.....

PLAIN WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	1,000	.....	.....	.....
½ in.	100	.....	.....	.....
⅝ in.	2,150	.....	8,000	16,900
¾ in.	274,800	.....	453,800	122,000
1 in.	42,300	1,700	78,000	85,200
1¼ in.	6,300	.....	15,100	.....
1½ in.	51,300	.....	84,000	12,000
2 in.	29,000	.....	125,000	54,000
2½ in.	152,800	.....	69,500	3,000
3 in.	55,800	.....	75,800	14,400
3½ in.	4,500	.....	4,000	1,500
4 in.	65,000	.....	38,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	24,200	.....	.....	.....
¾ in.	170,000	.....	327,000	65,800
⅝ in.	2,400	.....	77,000	42,600
1 in.	30,200	3,150	56,000	125,400
1¼ in.	11,700	2,400	16,600	.....
1½ in.	138,900	4,300	46,200	32,000
2 in.	91,500	.....	162,000	71,000
2½ in.	70,100	.....	26,000	3,700
3 in.	23,800	.....	20,500	7,000
4 in.	16,600	.....	10,900	.....

QUARTERED RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
¾ in.	1,700	.....	9,700	500
1 in.	10,200	5,400	7,500	1,400
1¼ in.	2,000	.....	.....	.....
1½ in.	.....	.....	.....	.....
2 in.	.....	.....	7,400	.....

SAP GUM

	1 & 2	Strips.	No. 1 Com.	No. 2 Com.
1 in.	.....	16,000	21,000	.....
1¼ in.	.....	.....	.....	.....
1½ in.	.....	2,400	6,000	13,500
2 in.	.....	.....	5,700	10,400
2½ in.	.....	.....	.....	.....

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	20,000	9,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

		No. 1	No. 2
1 in.	.....	16,300	10,900	9,500
1¼ in.	.....	6'000	8,325	.....
1½ in.	.....	12,000	13,300	9,500
2 in.	.....	9,000	3,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	2,000	6,000	7,000
5/4	9,400	10,800	.....
6/4	8,900	5,500	4,600
8/4	1,300	19,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No.2 Com.
⅝ in.	18,000	15,800	31,300	800
1 in.	27,000	5,200	91,900	.....
1¼ in.	22,300	360	5,700	6,000
1½ in.	19,100	13,000	29,000	7,500
2 in.	15,000	.....	10,500	24,500
2½ in.	10,800	6,000	.....	.....
3 in.	17,900	.....	11,400	47,000
4 in.	6,500	.....	300	450

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y.

Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill — *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White Oak Veneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

Sawed Veneer

Quartered White Oak

For Furniture and Panels

Plain Red Oak

For Interior Trim and Doors

Cypress

For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.

MEMPHIS, TENN.

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

ASH
OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

OUR EXPORT BRAND

Service **LHC** *Quality*

Prompt *Shipment*

SPECIAL
Plain White Oak
50 M' 1" FAS
30 M' 1¼" FAS
12 M' 1½" FAS
15 M' 2" FAS

SPECIAL
Plain White Oak
70 M' 1" No.1 C&S
20 M' 1¼" No.1 C&S
20 M' 1½" No.1 C&S
15 M' 2" No.1 C&S

GUM
ASH
OAK
POPLAR
CHESTNUT

LIVERPOOL HARDWOOD COMPANY Inc.

50 Church St. NEW YORK CITY
Bank of Commerce Bldg. MEMPHIS, TENN.

Ash Poplar Cypress

HAFNER

MANUFACTURING COMPANY

Specials For Immediate Delivery

60 M. Ft. 4/4" Fas Pl. Red Oak
20 " " 5/4" " " " "
20 " " 6/4" " " " "
85 " " 4/4" No. 1 C&S. Pl. Red Oak
76 " " 5/4" " " " " "
45 " " 6/4" " " " " "
90 " " 8/4" " " " " "

50 M. Ft. 4/4" Fas Pl. Wh. Oak
35 " " 5/4" " " " "
45 " " 8/4" " " " "
75 " " 4/4" No. 1 C&S. Pl. Wh. Oak
40 " " 5/4" " " " " "
65 " " 6/4" " " " " "
20 " " 8/4" " " " " "

ST. LOUIS, MO., U.S.A.

ESTABLISHED 1871

Oak Red Gum

Why Bruce Hardwoods Excel

For many years before we became hardwood lumber manufacturers, we were makers of fine Oak Flooring and are to-day the largest individual producers of that material.

The producing of good Oak Flooring is an exacting science—where perfection is attained—and teaches the value of both skilful grading of raw material and accuracy in milling.

With a full appreciation of the value of these factors, we entered also upon the manufacture of southern hardwoods and in the operation of this department, have applied them in the production of all items in white and red oak, gum, ash and other species.

With our joint facilities, we are equipped to ship square edge parquetry strips, oak trim and mouldings, as well as Oak Flooring in the same car with hardwood lumber.

Inquiry and correspondence invited.

E. L. BRUCE COMPANY
MANUFACTURERS
MEMPHIS, TENN.

Band Mill: Little Rock
Oak Flooring Plants: Memphis; Little Rock

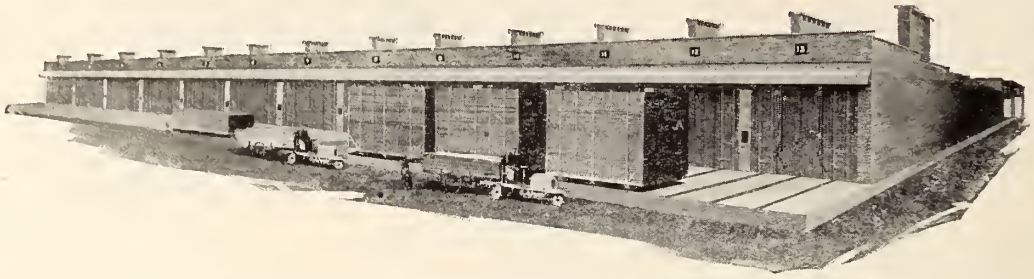
Walnut
Oak
Poplar
Chestnut
Gum
Ash

Will Ship High Class Stock and Make Prompt Shipment.

Leland G. Banning
Cincinnati, Ohio

Canadian Representative:
A. E. Klippert, 11 Laxton Ave
Toronto

KILN DRIED HARDWOODS



Kiln capacity 3,000,000 ft. monthly

WEST VIRGINIA
OAK
CHESTNUT
WHITEWOOD
BIRCH
HICKORY

We earnestly solicit your inquiries

ARKANSAS
RED GUM
SAP GUM
OAK
ASH
ELM

The M. B. Farrin Lumber Co.

CINCINNATI, OHIO

Dependable Shippers of American Hardwoods

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED
1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars

All Canadian and American Hardwoods
Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

EASTERN BRANCH—38 GREY NUN STREET, MONTREAL

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO
Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.
Subscription, $2.00 a year; foreign, $2.50.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 Toronto, March, 1922 No. 3

Can Shrinking be Prevented?

An article which appeared recently in a contemporary contained misleading and incorrect information pertaining to the shrinkage of lumber during the drying operation. In this treatise, the writer, F. H. LeMont, made the following statements; "You can practically eliminate all shrinkage of lumber in thickness and width. When properly kiln dried, six months air dried boards calipered thicker when they came out of the kiln than when they went in. Correct drying would almost eliminate this shrinkage from the green size of the board and therefore save at least 10 per cent of the lumber."

Now a ten per cent saving on all lumber going through the kiln is well worth considering, but in this case the manner in which the saving is to be effected is in direct opposition to the best kiln-drying practice and is not practical. To eliminate or even reduce the shrinkage which ordinarily occurs the wood itself must suffer. The tendency for lumber to shrink as the moisture leaves it, is a natural movement, similar to the shrinking and expanding of metals through the application of heat or cold, and as such cannot be prevented or eliminated. It can, however, be resisted and the outside dimensions held to size, by casehardening the outer surfaces early in the drying period. When this is done either the shrinkage occurs in the centre of the pieces injuring the fibres and causing interior checking and honeycombing or internal stresses and strains are set up, through the fibres attempting to shrink, which seriously impair the value of the wood.

The Forests Products Laboratory, Madison, Wis., was asked to outline the results of their investigations along this line. Their reply, which follows, is clear and emphatic and does not leave much doubt as to the effect of attempting to resist shrinking:

"This entire matter of shrinkage has come up a number of times. While it is possible to vary the amount of shrinkage in wood by means of different kinds of drying treatments, I think I am safe in making the broad statement that wood dried in the kiln in such a manner that it will be free from drying stresses and drying defects will have shrunken at least as much as if it had been air dried to the same moisture content. The statement, often made that the slower and milder the drying treatment the greater the amount of shrinkage is probably correct, if one considers straight drying only. If, however, steaming treatments are also taken into consideration the situation becomes considerably more complex since the persistent use of high temperature drying coupled with frequent steaming treatments will produce an unusually large amount of shrinkage.

"As a matter of fact, the shrinkage will, in general, be somewhat greater than that secured in air seasoning on account of a slight tendency in the case of the air dried material to set in an expanded condition, a tendency ordinarily overcome in kiln drying by means of steaming and high humidity treatments. So far as our experience goes, any treatment which causes the stock to set in an expanded condition, such as for instance a very rapid surface drying of green stock, is extremely liable to produce checking and honey-combing, and is almost sure to result in stresses which are so severe that they reduce the usefulness of the stock very materially."

The drying of lumber by artificial means is an extremely important operation and a considerable amount of money may be saved or lost in this department. Few plants are securing the results they should or could secure from their dry kilns. In the average furniture factory, for instance, drying costs are needlessly high, either because the kiln itself is not properly designed or equipped or because it is not operated in an intelligent manner. The result is that losses from checking, warping, etc., take a high toll; strains and stresses in the dried lumber make trouble in various ways and the drying periods are unnecessarily long making for high drying costs. It would be far better to attempt to place the drying operation on a more efficient basis than to give much thought to such impractical suggestions as the prevention of shrinking.

Each issue of the "Canadian Woodworker and Furniture Manufacturer" contains a practical, instructive article dealing with some phase of the kiln drying operation. These are prepared by men of wide practical experience and should prove helpful to all who maintain a dry kiln. In this connection the "Canadian Woodworker" welcomes requests for information dealing with any phase of the drying operation. Send in an outline of the drying troubles you are experiencing. The result may surprise you.

Wood Toy Industry in British Columbia

Circumscribed by Smallness of Local Market—As Freight Rates are Lowered and Adjusted Will Compete for Trade of Prairie Provinces—How Millar & Coe, Limited are Developing

By Geo. S. Perry, Vancouver

With wood production its chief, and heretofore its most important industry, from point of view of value of annual returns, it is somewhat surprising that British Columbia has not so far come to the front in the manufacture of wooden toys, which at all times, and never more than now, have a great vogue with the younger generation. Considering the rapid strides made in so many lines of manufacture in the Pacific

R. M. Millar, President, Millar & Coe, Limited, Vancouver.

province, and very particularly in woodworking industries, the lack of expansion in the important industry of making wooden toys is still more surprising.

It is not to be taken as a criterion that two factories have been started in the past three years, both of which have succumbed to the stress of establishing a market in face of keen competition. Nor is the fact that at least one of these factories had the support and financial assistance of the B. C. Government's Industrial Department any indication of what the wood toy industry will do to any one who has the nerve to attempt it in British Columbia..

Makes Lines Suited to B. C. Woods

One toy factory, not started with any great flourish of trumpets, and not assisted by any Government loan, has made good in the past two seasons in Vancouver. Mr. R. M. Millar, president of Millar & Coe., Ltd., explains how his firm made a venture in wood toy making which has proven successful, and which gives indications of expanding as time goes on. It is just as well to point out that a long experience in the retail and jobbing trade in Vancouver has given Mr. Millar an insight into what to attempt and what to leave alone. In confining his factory work to lines best suited to B. C. soft woods, and not attempting others where hardwood is best, his firm has found its success. Also in making only the best classes of goods, and not, so far at any rate, attempting mass production, safe policy has been followed.

"At first," said Mr. Millar, "we only made up stock for our own store. Good wooden toys are always popluar, and are possibly the best sellers. Our plant even now is not a pretentious or expensive affair. We put in jig-saws, a lathe, cut-off saw, and similar machines, and while we keep some men employed all the time, it is only in advance of the Christmas trade that we start to make up any quantities of stock.

Produce Attractive Variety

"We have made, among many lines, wooden swings, small boats and canoes, for which the B. C. cedar is well adapted, children's bake boards, wooden vehicles, such as locomotives, with trains of cars, toy autos, etc. But where hardwood is most suitable or durable, we still buy in Eastern Canada and other markets. For example, the well-known 'kiddie kar' made in an Ontario factory, is one of the most widely advertised of toys. It is made of hardwood, and the Ontario Maple is better suited than B. C. fir for such a toy. There is another consideration too. That is the freight rates. Until a fair adjustment of the freight rates is arrived at, wooden toys made in B. C. could not even reach the prairie provinces on a competitive basis let alone any advantage through being local production. Of course that freight question applies to all our manufacturers in this province to a great extent.

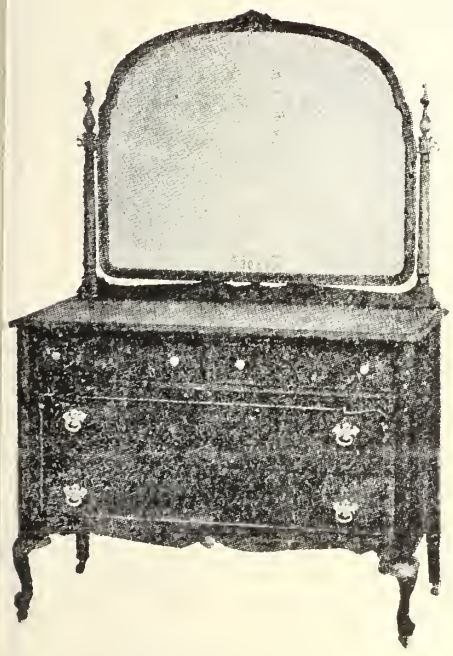
"So far as our local market is concerned," replied Mr. Millar to a question, "it must be remembered that there are only 500,000 people in the whole province. While we first started making toys for our own trade, we have found a very good demand from outside points, and have begun to fill orders from many parts of the province. As that trade grows we may extend our operations, and may even consider going into mass production. This we have avoided so far because of the comparatively small local market, and have confined ourself to making the high-class goods. We have not, for instance, attempted making rocking-horses, because the makers of those, in the U. S. turn out such huge quantities we could not hope to compete."

Look Forward to Steady Growth

"We have only been in the toy making business for a little over a year, and have gone very slowly, feeling our way carefully. Still, we have every confidence that in time the manufacture of wooden toys for which B. C. woods are suitable, will become a large industry, and as we can develop and enlarge our market outside of Vancouver, our small plant will naturally be increased," was Mr. Millar's concluding remark.

The tenoning machine can be easily safeguarded and it is sheer carelessness to leave the cutters exposed so that they are a danger to anyone passing by

When Your Competitor Undersells You

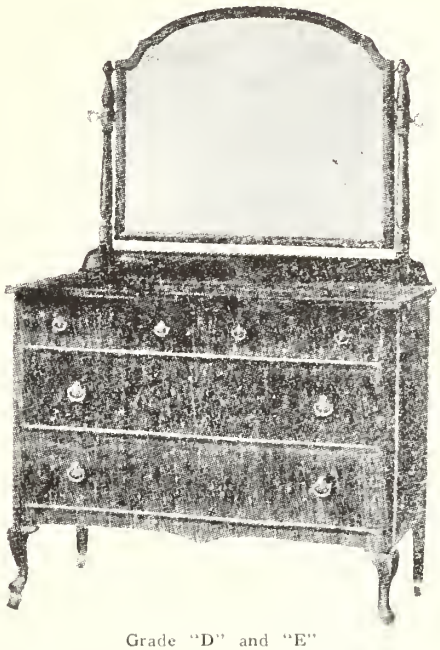


Grade "B-1" and "C-1"

Which Dresser Would You Rather Make at $40.00?

Appearance or Comparative Similarity Does Not Determine Value.

Costs Compared Showing Reason for Difference in Price.



Grade "D" and "E"

How often, when opening your morning's mail, have you been startled by a report from one of your representatives to the effect that so and so is making a piece of furniture very similar to your No.—and selling it at a price much lower than yours? Such is not infrequent occurrence if one may judge from the remarks of different furniture manufacturers. Often when an incident of this kind occurs it is the signal for a miniature price war. Practically every furniture manufacturer prides himself on his ability to manufacture and sell as cheaply as his competitor, with the result that he resolves to "show the other fellow" even though it is going to cost him some good money to do so and at the same time tend to undermine the confidence of the retail trade.

When an occasion like this arises the furniture manufacturer is badly handicapped for he has not seen the piece in question, being forced to rely on the report of the salesman or retailer and is, therefore, not in a position to judge as to the value of the article his competitor is offering. In almost every case a thorough examination and comparison of the two items in question would disclose the reason for the difference in price.

Quantity Production May Enter

At the present time the majority of furniture plants in Canada are being operated along fairly efficient lines and as a result it is difficult to understand how one can undersell the other to any marked degree. Of course if one manufacturer is selling at a price which retails a loss, it is only a question of time before he will be faced with the necessity of increasing his prices. Apart from the question of value given, the influence of quantity production on costs must not be overlooked. Suppose two furniture makers are producing a dresser which is very similar in appearance and value. These are being made in each plant in lots of 50 and offered for approximately the same price. Suppose one manufacturer finds or believes that by reducing his price he can secure sufficient business to warrant him cutting in lots of 500. Is it not possible that the savings effected through running in larger quantities, would enable him to make the same profit per piece at a much lower price, provided, of course, that both methods and equipment are adapted to quantity production.

Deliver Only Value Sold

The example of the two dressers shown herewith is entirely different. While to all appearances there is little to choose between the two pieces, yet there is a big difference in price. The purchaser secures just what he pays for in each case. According to A. C. Brown, secretary of the National Alliance of Case Goods Manufacturers, dressers similar to these were sold at the Grand Rapids market for from $40.00 to $70.00 each. To quote Mr. Brown further, "The most surprising thing about this was that no one, buyer, factory manager or salesman, seemed to get greatly excited over the situation. The fact is that the buyer will get what he paid for and in practically every case the seller will make a profit on what he delivers."

"Never before was this matter viewed so sensibly as during the last market. The reason, no doubt, is that both buyer and seller are giving consideration to the fact that as a rule the manufacturer is only delivering the value that he sells, and it is becoming generally understood that no manufacturer can for any length of time, deliver more than he is paid for and remain in business.

How Value Varies in Each Grade

"It is also a fact that retail buyers are studying grades more than ever before and are not influenced to as great an extent as formerly by the price alone.

"The value of goods should be measured from the units that are to be used when the goods are sold to the ultimate consumer. If suites are sold then they should be judged as suites and bought as suites after careful consideration as to value. It does not seem to be good policy to judge a suite by the dresser or buf-

DETAILS OF COST
GRADE "B-1"—48-INCH DRESSER

8/4 Walnut, includes waste—6-3/4 ft. at	.256	$ 1.73
6/4 Walnut, includes waste—5-1/4 ft. at	.248	1.30
4/4 Walnut, includes waste—5 ft. at	.128	.64
4/4 Sap Gum, includes waste—14-1/2 ft. at	.033	.48
3/4 Birch, includes waste—18-1/2 ft. at	.033	.61
5-Ply Figured Walnut Top, Rimmed Edge—7-1/3 ft. at	.37½	2.75
5-Ply Figured Walnut Fronts—6-1/2 ft. at	.34½	2.24
5-Ply Plain Walnut Ends—6-7/10 ft. at	.23	1.54
3-Ply Mahogany Drawer Bottoms—16-1/2 ft. at	.09	1.48
3-Ply Back Gum—7-1/2 ft. at	.05	.38
3-Ply Mirror Back Gum—8-1/3 ft. at	.04	.33
1-Ply Dust Bottom—20-1/2 ft. at	.024	.49
Glue and Sand Paper		.45
Factory Hardware		.04
Casters		.18
Ornaments		.55
Finishing Materials		1.18
Trimmings		1.25
Mirror 2nd Quality 28 x 38 inch with 4 per cent for waste		10.50
Packing Supplies		.22
Packing Lumber, includes waste—42 ft. at	.025	1.05
Total Materials		$28.94
Direct and Indirect Labor		9.50
Factory Burden		4.75
Factory Cost		$43.19
Selling and Administration Expense		10.80
Gross Cost—No Profit		$53.99

DETAILS OF COST
GRADE "C-1"—48-INCH DRESSER

8/4 Quartered Red Gum, includes waste—6-3/4 ft. at	.138	$ .93
6/4 Red Gum, includes waste—5-1/4 ft. at	.116	.61
4/4 Red Gum, includes waste—5 ft. at	.07	.35
4/4 Sap Gum, includes waste—14-1/2 ft. at	.033	.48
3/4 Birch, includes waste—18-1/2 ft. at	.033	.61
1-Ply Dust Bottoms—20-1/2 ft. at	.024	.49
5-Ply Plain Walnut Top—Rimmed Edge—7-1/3 ft. at	.275	2.02
5-Ply Plain Walnut Front—6-1/2 ft. at	.245	1.59
5-Ply Plain Walnut Ends—6-7/10 ft. at	.23	1.54
3-Ply Mahogany Drawer Bottoms—16-1/2 ft. at	.09	1.48
3-Ply Back Gum—7-1/2 ft. at	.05	.38
3-Ply Mirror Back Gum—8-1/3 ft. at	.04	.33
Glue and Sand Paper		.40
Factory Hardware		.04
Casters		.14
Ornaments		.55
Finishing Material		.90
Trimmings		.90
Mirror comm. quality 28 x 38 inch with 4 per cent for waste		7.92
Packing Supplies		.22
5-Ply Plain Walnut Top, no Rim, Gum Core—7-1/3 ft. at		3.[illegible]
Packing Lumber, includes waste—42 ft. at	.025	1.05
Total Material		$22.93
Direct and Indirect Labor		9.00
Factory Burden		4.50
Factory Cost		$36.43
Selling and Administration		9.11
Gross Cost—No Profit		$45.54

fet alone without regard to the value of the assembly as a unit."

An examination of the cost figures shown will indicate why there is a difference in price and value even though the pieces are very similar in appearance. When made to B 1 grade specifications the material consists of solid walnut, five-ply figured walnut top with rimmed edge, five-ply figured walnut front, five-ply plain walnut ends, three-ply mahogany drawer bottoms, three-ply mirror and case backs, one-ply dust bottom. C 1 specifications call for quartered red gum, five-ply plain walnut top with rimmed edge, five-ply plain walnut front, five-ply plain walnut ends, three-ply mahogany drawer bottoms, three-ply case and mirror backs and one-ply dust bottoms. Dropping to grade D specifications, the case is made up of quartered sap gum ,five-ply plain walnut top, no rim, three-ply plain walnut front, three-ply ¼" plain walnut ends, three-ply gum drawer bottoms, and three-ply case and mirror back. Grade E is made up of quartered sap gum, five-ply walnut top, three-ply walnut fronts, three-ply ¼" walnut ends, three-ply case back, one-ply drawer bottoms, one-ply paper mirror back. A comparison of these items will show that in each case the purchaser secures good value for what he pays, but no more.

If a furniture manufacturer knows that his costs are reasonable, that his methods and equipment are such that he can produce a dependable product as cheaply as his competitor, he need not worry very much about the prices others make. If certain of his competitors are underselling him, it can almost be taken for granted that they are selling at or below cost, which is a very poor policy. It is far more profitable to concentrate on one's own problems, to try and improve one's own methods, to keep one's own plant as efficient and up to date as possible than it is to give any thought to what others are doing.

DETAILS OF COST
GRADE "D"—48-INCH DRESSER

8/4 Quarter Sap Gum, includes waste—6-3/4 ft. at	.077	$ .52
4/4 Quarter Sap Gum, includes waste—10 ft. at	.04-1/2	.45
4/4 Sap Gum, includes waste—7 ft. at	.033	.23
3/4 Sap Gum, includes waste—18-1/2 ft. at	.024	.44
5-Ply Plain Walnut Top, no Rim, Gum Core—7-1/3 ft. at	.225	1.65
3-Ply Plain Walnut Front—6-1/2 ft. at	.225	1.48
3-Ply 1/4 Plain Walnut Ends—6-7/10 ft. at	.14	.94
3-Ply Gum Drawer Bottoms—16-1/2 ft. at	.05	.82
3-Ply Gum Backs—6 ft. at	.05	.30
3-Ply Gum Mirror Back—8-1/3 ft. at	.04	.33
1-Ply Dust Bottom—7 ft. at	.022	.16
Glue and Sand Paper		.35
Factory Hardware		.04
Casters		.09
Finishing Material		.75
Trimmings		.70
Mirror comm. quality 28 x 38 inch with 4 per cent for waste		7.92
Packing Supplies		.22
Packing Lumber—42 ft. at	.02	.84
Total Material		$18.25
Direct and Indirect Labor		6.10
Factory Burden		3.05
Factory Cost		$27.38
Selling and Administration		6.84
Gross Cost—No Profit		$34.22

C. L. Willey Company not Corporation

In the advertisment of the C. L. Willey Company, Chicago, manufacturers of hardwood lumber and veneers, which appeared on page 87 of the March "Canadian Woodworker and Furniture Manufacturer," the name of this progressive concern was given as C. L. Willey Corporation instead of C. L. Willey Company. Although the C. L. Willey Company, is incorporated, its corporate name is "company" and not "corporation." The difference may appear trivial for although the company is a corporation and a corporation is a company, yet "Smith" and "Smyth" sound the same yet neither Mr. Smith or Mr. Smyth likes to have his name mis-spelled.

As the fault was ours, we take this opportunity of acknowledging our error and offering our apologies to the C. L. Willey Company for the mis-spelling of their name.

DETAILS OF COST
GRADE "E"—48-INCH DRESSER

8/4 Quarter Sap Gum, includes waste—6-3/4 ft. at	.077	$ .52
4/4 Quarter Sap Gum, includes waste—10 ft. at	.04-1/2	.45
4/4 Sap Gum, includes waste—7 ft. at	.033	.23
3/4 Sap Gum, includes waste—18-1/2 ft. at	.024	.44
5-Ply Walnut Top, no Rims—7-1/3 ft. at	.225	1.65
3-Ply Walnut Front—6-1/2 ft. at	.225	1.48
3-Ply 1/4 Walnut Ends—6-7/10 ft. at	.14	.94
3-Ply Gum Backs—6 ft. at	.05	.30
1-Ply Drawer Bottoms, including waste—20 ft. at	.024	.48
1-Ply Paper Mirror Back		.12
Glue and Sand Paper		.30
Factory Hardware		.04
Casters		.07
Finishing Material		.54
Trimmings		.60
Mirror comm. quality 28 x 38-inch with 4 per cent for waste		7.92
Packing Supplies		.20
Packing Lumber—42 ft. at	.02	.84
Material Cost		$17.12
Direct and Indirect Labor		5.47
Factory Burden		2.73
Factory Cost		$25.32
Selling and Administration		6.33
Gross Cost—No Profit		$31.65

How to Put Your Plant on Efficient Basis

Some Points Covered

Standardization or "One Best Way"—Time Studies and Adoption of Standard Times—Planning and Routing Department—Advantage of Monthly Cost Statements

By L. G. CATTERMOLE*

It is necessary that all vital information relative to the manufacture and sale of the product, and the finances of the enterprise be compiled in such form that they provide immediate records for the use of managerial control. No plant should make itself liable to being crippled through the loss of any single individual, who may have a knowledge of the operation of that business which the management does not have.

In the early stages of management engineering installation it is advisable to inaugurate time study work. This is for the purpose of setting rates, and providing time allowances for planning the work through the factory, as well as determining group and departmental capacities. Whether or not this work is done by the local plant personnel, or by engineers placed in charge of the work, must be determined after a thorough knowledge of local conditions has been obtained. If the right calibered men are available in your organization, it is sometimes better to have them do this work under the engineer's supervision, particularly if a large amount of detail work is involved.

Part Stock Store Room

It is desirable, when manufacturing standard, interchangeable parts, and when deliveries are desired within too short a time to manufacture the product complete after receipt of the customer's order, to maintain part stock store rooms. This reduces the work-in-process inventory of the product "in the white," or completed with various finishes. Commonsense must be the governing factor in this, as in all other methods. In checking over the part stock of a large table factory it was found that a sufficient number of certain parts were on hand to last for 65 years at the normal rate of demand.

Store rooms should also be established for tools, patterns, templets, etc., so that they can be kept in the best possible condition, and be instantly available for use.

It would be impossible, in this brief survey, to begin to cover the subject of Standardization—or as F. W. Taylor expressed it "the one best way"—in the woodworking industry. Suffice it to say that this field is one of the largest in affording opportunities for improvement.

The speed of saws, knives and cutters, and the feed of machines, are as a rule, in this industry, in a sad condition of unstandardization. Seldom, if ever, are machines run at their maximum capacity. Very often this is due to the poor condition in which the machines are kept; oftener, however, it is due to the attitude prevailing in the plant, namely "I have done it this way for fifty years—I don't see why I should change now." Yet many times a few minor changes in cutter speeds, number of knives on a cutter head and machine feeds have resulted in doubled and tripled output, with very little increase in effort on the part of the operative.

Development of Planning Methods

In its narrowest sense, planning consists of scheduling parts through the necessary operations, machines or departments to enable them to be completed in the shortest possible time to meet the assemblies at the proper time; and to keep machines and operatives always busy. In its broadest scope, however, it involves a great many other factors, such as machine and equipment maintenance; purchasing and stores methods; scheduling and control of factory orders with the proper knowledge of plant capacities, follow-up of orders until shipped, time-keeping and payroll functions, and the collection of direct labor costs.

The case for planning being separated from the execution of work has been so well proved in the past, that it is needless to emphasize it at this time. Planning methods should, in woodworking, be both as simple and effective as possible. Perhaps one of the most effective methods that has so far been developed for planning in this country is the "color cycle" method of control. This can be used for manufacturing either to customers' orders or to stock or both. It has proved in actual practice to be both simple and flexible.

With his method, customers' or stock orders, or both, are grouped into a "cycle color"—composed of one or two weeks output of the factory. Work orders, as issued to the factory, carry the cycle color to which they have been assigned, foremen and men giving preference at all times to any old cycle colors which may still remain in the department, before starting work on the current cycle color. From four to six cycle colors are used, each one or two week period during the year being assigned to a definite color. As each order of parts or assemblies is cleared from a department, it is checked off the departmental order-of-work sheet which also carries the cycle color. The status of any department at any time can be determined by a brief examination of this order-of-work sheet.

Increasing Production and Reducing Costs

An important feature of the development of betterment methods is the selection of the plan of wage payment, which should be based on careful study and analysis. Upon it will depend the possibility of securing satisfied operatives, reduced costs and increased production. The most satisfactory methods of wage payment cover increased production, better quality workmanship, and elimination of waste.

It is not uncommon, through the application of a

*Chief Industrial Engineer, Cooley & Marvin & Co.

carefully prepared wage incentive, to reduce direct labor costs from fifteen to thirty per cent; increased production twenty-five to fifty per cent; increase operatives pay ten to forty per cent; reduce waste (that bug-a-boo of the woodworking industry) ten to twenty-five per cent; and reduce the number of defective parts caused by poor workmanship from ten to thirty per cent.

All operations can be measured by time, and as time is the most important element in manufacture, it is highly desirable that the wage payment should be based on time. In other words, the more nearly the operatives approach the standard time required for an operation, the greater their pay per unit of time should be. Time is a means, also, by which entirely dissimilar operatives, groups, departments or plants can be compared, for the more nearly each unit approaches the standard, the closer to 100% it will be.

Time is also of great value in planning the work through the factory and becomes the means by which the possible capacity of a unit can be determined. The time studies, previously mentioned, are used for the determination of the time standards, or the "rate setting" as it is known. After the rates have been set, it becomes necessary to personally install them, working with the operatives until it has been proved to both management and workers that the rates are just and fair.

It is highly desirable that correct cost methods should be inaugurated concurrently with the development of plant betterment methods. In this way the cost accumulation records may be adapted to the requirements of efficient production, and unnecessary duplication may be avoided.

In order to insure the dependability of the cost figures, it is necessary to provide for proof of their accuracy. This is most satisfactorily accomplished by the introduction of controlling accounts in the general books, and by providing for monthly operating statements, by means of which any general inaccuracies in the costs may be discovered and corrected. In this way it is also possible to prepare a series of financial statements showing currently the condition of the company and the results of its operations from month to month, or oftener, if so desired.

The maximum utility of cost information is obtained by presenting all cost statistics in comparative form. By this means any increase in either the cost of product, or in any of the operating expenses, may be recognized and corrected currently.

(Concluded in May issue)

Is it Profitable to Sell at a Loss?

by Wallace Clark

At what low point in either production or prices does it become unprofitable to continue operations, or,to put it in another way, at what point does the loss from manufacturing drop below that which would be incurred were the plant to be closed down? One large steel industry has found that when production falls below 70% of normal, the manufacturing losses are greater than those due to idleness. .The writer of this article suggests that when orders are scarce, when the work in progress and in view is not sufficient to keep the plant operating at normal productiveness, it is advisable to reduce prices in an effort to bring in more business. He outlines his idea of how far prices may be cut before manufacturing losses exceed those due to a stoppage of active operations.

The man who is responsible for the success or failure of a business is in normal times interested in getting an answer to the question: "How can we increase our profits?" However, when he has few orders in his plant, he is more interested in knowing: "How can we reduce our losses?"

In a period of dull business there are in every manufacturing plant certain expenditures which must go on no matter how few orders there are. The only way to avoid these expenditures is to sell out and in these days that means giving away the plant. If the business is not sold out, it is obvious that the buildings and equipment of every kind must be kept in such condition that they will not deteriorate.

If any work at all is to be done, a skeleton organization must be kept in the shop; that is, the superintendent, the foreman, inspectors, truckmen, watchmen, and so on must be retained. The manager usually tries every other way out before he gives up the nucleus of his working force, because he knows that it will be easier to erect new buildings and buy new machines than to rebuild his organization.

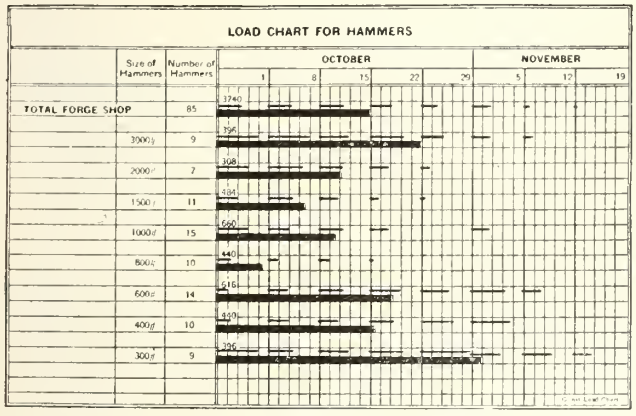
*In March "Factory."

Aim at Reducing Losses

For the sake of simplicity, let us take a one-product plant such as a foundry or, better still a drop forge shop which makes forgings for other companies. The manager has ceased to buy any steel except what is required for actual orders in hand. If he has had sufficient money or credit, he has made the repairs or improvements to his hammers, furnaces, and buildings which he had not had time to do when the shop was full of work. Let us suppose that all this has been done and that he is down to his skeleton organization and has not even enough orders in his plant to keep those men busy. He is loosing a good deal of money each month. What is his next step? How is he going to reduce his losses? The manager has, of course, attempted all along to keep up his sales. He has been unusually careful of the quality of his forgings, has met all delivery promises, has increased his advertising and sent out more salesmen. The only remaining way to increase sales is by a considerable reduction in price. It is natural for him to shrink from this course and before he takes it he wants to know how far he can reduce prices without increasing his losses.

There are certain expenses which must go on if

the shop is kept ready for work: the interest on the investment in land, buildings and equipment, depreciation, taxes, insurance, repairs and the salaries of the skeleton organization. The shop must be provided with light, heat, water and compressed air. All these expenses go on whether there is work or not and they are due to keeping the shop ready for work and are not increased or decreased by the acceptance of an order. It is, therefore, clear that



Helps Manager Visualize Work Ahead

these overhead expenses or losses will not be increased by the acceptance of an order at a price which does not cover any of this overhead.

Must cover Direct Costs

However, the acceptance of an order for forgings will cause certain other expenses. Steel must be bought or drawn from stores: one or more hammer men must be hired; power must be used for the hammers, although this additional expense for power will be small, for insurance regulations usually require that steam be kept up for the operation of fire protection appartus. Fuel must also be used in the forges. These expense are caused by the acceptance of any specific order and the price must, therefore, cover such expenses, that is, the cost of material, direct labor, some power for the hammers, and fuel for the furnaces, for if the price does not cover those out-of-pocket expenses, the acceptance of that order will increase the losses.

Going back to the question: "How far can prices be reduced without increasing losses?" the answer is: "To a point which covers the cost of material, direct labor, power, and fuel, but which does not cover any part of the overhead."

Sell Below Cost Without Increasing Losses

In other words, it is possible to sell below cost without increasing losses. When I speak of selling at this material-labor-power-fuel cost without loss of money, I do not mean to say that that is the real cost of the forgings, for it is not. A portion of the overhead of the department and plant has been used in the production of the forgings and must ,therefore, be charged into their cost. However, we are talking of reducing losses rather than making profits, which, of course, must be based on costs.

Since we have found how low prices can be quoted without increasing losses, the next question is: "What prices should be quoted to reduce losses?"

Knowing that he has nothing to lose until he reaches the material-labor-power-fuel cost the manager begins to lower his quotations and keeps on until he gets the orders. It is not likely that he will have to go as low as the point mentioned. When he does reach the level at which he can secure orders, how long should he continue to quote those prices?

To make this clear, let me tell you how we worked it out in one drop forging plant.

Vary Price According to Value of Orders

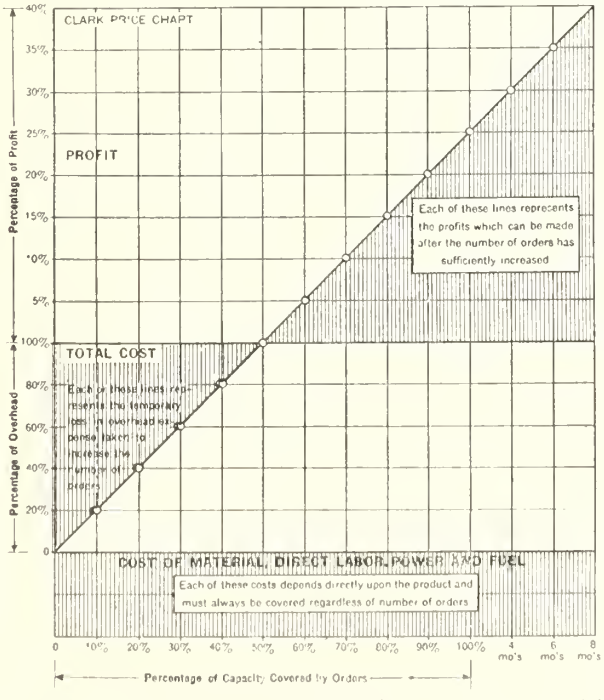
The reason for quoting low prices was the small amount of work in the plant and it was evident that the prices should fluctuate as the work ahead fluctuated. On a Gantt layout chart the work ahead of the hammers was shown. Looking at the second line of this chart, there were nine 3,000-pound hammers in the shop and in a 44-hour week their capacity was 396 hours. They had work assigned to them which would keep them busy 80% of the time as shown by the light line. It was the same the second week, but for the week ending November 12, only 20% of their capacity was taken up. The heavy line showed that the total work ahead of the 3,000-pound hammers would keep them busy for four weeks if it could have been spread over them evenly. The 800-pound hammers, however, had less than one week's work ahead.

The first line of the chart showed the total work ahead of the forge shop. In the first week 50% of the time was taken up, which gradually decreased until there was only 10% in the week of November 19.

This chart was made out at the beginning of each week and showed the work ahead of the plant at that time.

The More Work Ahead the Higher the Price

The lower part of the cost chart shows the cost of material, direct labor, power and fuel. The next line is total cost and above that is profit. Across the bottom of the chart was the percentage of capacity covered by orders, By experiment it was found that


CLARK PRICE CHART
PROFIT
Each of these lines represents the profits which can be made after the number of orders has sufficiently increased
TOTAL COST
COST OF MATERIAL, DIRECT LABOR, POWER AND FUEL
Each of these costs depends directly upon the product and must always be covered regardless of number of orders
Percentage of Profit
Percentage of Overhead
Percentage of Capacity Covered by Orders

Cost Chart Showing How Prices Were Reduced According to Volume of Work Going Through

if the load chart showed 10% of the capacity taken up with orders, prices should be quoted which covered the cost of material, direct labor, power and fuel, and only 20% of the overhead. When 30% of the capacity was taken up, the prices to be quoted should include 60% of the overhead. With 50% of capacity, the prices covered all the overhead, that is, the total

cost. Profits began when the shop was more than half full of work and at 60% of capacity, 5% of profit was quoted. When 100% of capacity was taken up, 25% profit was quoted. When delivery was not wanted for six months or the work ahead prevented the promising of delivery in less than six months, there was greater danger of increases in cost of material and labor and, therefore, 35% profit was quoted.

These two charts were put in the hands of the man who quoted prices and he used them as a guide. This price chart was made for a specific plant and would have to be changed for any other plant. The price line would either be more or less perpendicular than this line. This is an example of working out the Gantt theory of the cost of idleness and applying that theory to the quoting of prices.

When there is plenty of work ahead, prices should be quoted which will produce profits, but when there is little work to be had, prices should be quoted which will reduce losses. Losses must be eliminated before there can be any profits.

Kiln Drying Facts for Busy Executives

Can Shrinkage be Controlled and Eliminated?—If Tendency to Shrink is Resisted what Effect will it Have on Lumber?—Improved Drying Methods and Equipment Offer Chance for Economies

By Wm. Snaith, Associate Engineer, Forests Products Engineering Co., Chicago

The busy factory executive and those to whom the more important functions of plant management have been delegated very often do not have the time, or the inclination, to closely study kiln drying methods and theory. This important subject, which has all the appearance of complexity and does, in fact, call for more than a little technical knowledge, is, however, based on a few broad fundamental principles and it is the purpose of this article to enunciate one of the principal of these which if rightly understood will enable the executive to properly appreciate what can and cannot be accomplished in the drying operation.

I am inspired to write this by some statements I recently saw in a circular which was intended to convey the impression that the shrinkage of lumber could be entirely eliminated by some special method or methods which the author of the circular had conceived. Such statements fly directly in the face of natural physical laws. The particular elementary principle which is violated by these claims is the important fact which can be briefly stated thus,—Lumber can not be expanded in drying, but shrinks nearly in direct proportion to the amount of moisture removed. This statement holds true as long as it is understood that the lumber is not to be injured. Of course it is possible to reduce shrinkage by casehardening and honey-combing, but we do not suppose that the author of the circular intended to advise the production of these ill effects.

Conforms to Fundamental Laws

The physical laws pertaining to the shrinkage of lumber through extraction of moisture are just as surely known as the laws pertaining to contraction and expansion of metal in verying temperatures. The following figures taken from circular 213, issued by the Forest Service branch of the U. S. Department of Agriculture, give the average shrinkage which takes place in different woods when being reduced from green to oven dry condition:

LUMBER SHRINKAGE (per cent) GREEN TO OVEN-DRY.

SPECIES	Regional growth	In total volume	In Radial direction	In tangential direction
Basswood	Penna.	16.5	6.8	9.9
Basswood	Wisc.	14.5	6.2	8.4
Beech	Ind.	16.5	4.6	10.5
Beech	Penna.	15.8	5.1	10.6
Birch, yellow	Wisc.	17.0	7.9	9.0
Birch, yellow	Penna.	16.7	6.9	8.9
Chestnut	Tenn.	12.9	3.4	6.8
Elm, cork	Wisc.	14.1	4.8	8.1
Gum, red		15.0	5.2	9.9
Maple, sugar	Penna.	14.7	4.8	9.2
Maple, sugar	Ind.	14.3	4.9	9.1
Maple, silver	Wisc.	12.0	3.0	7.2
Oak, white swamp	Ind.	17.7	5.5	10.6
Oak, white	La.	16.0	4.8	9.2
Oak, white	Ark.	15.8	6.2	8.3
Oak, red	Tenn.	15.3	3.7	8.3
Oak, white	Ind.	14.3	4.9	9.0
Oak, red	Ind.	13.1	3.7	8.3

In the foregoing table we have shown the various regional growths in the sequence of increased shrinkage in volume of the various species of the same group. For example, Indiana white swamp oak shrinks the greatest amount in volume of any of the other oaks shown. An explanation of the two principal directions of shrinkage, tangential and radial, is given in the accompanying sketches, the third, longitudinal is negligible, as much so as thermal expansion and contraction.

Occurs After Free Moisture has been Removed

It will be noted from the shrinkage table that in the radial direction very few of the species shown, shrink more than 6%, only one being higher than 7%. Furthermore it must be remembered that the percent. of shrinkage shown is the total from green to oven dry. It is a well known fact that oven dry lumber is unfit for commercial use, perhaps as much so as lumber containing too high a moisture content.

Moisture is contained in the tree, both in the actu-

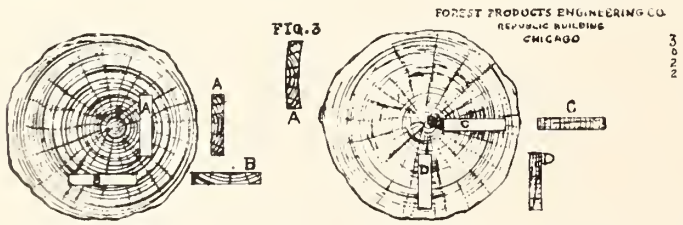


FIG. 1. Two boards, A and B, cut from different sections of the tree altho both are plain sawn. Tangential direction.

FIG. 2. Two boards, C and D, cut from different sections of the tree altho both are quarter sawn. Radial direction

FIG. 3. Indicates how the board A will naturally warp. This can be prevented by proper treatment altho it is physically impossible to prevent shrinkage without serious injury.

Principle Directions in which Shrinkage Takes Place

al fibrous structure and in the open spaces or pores between the fibres. The former is known as "fibre moisture" and the latter as "free moisture."

The total shrinkage from green to oven dry generally takes place after the free moisture has been eliminated and during the process of reducing the fibre moisture. The fibre moisture point is known to be between 25 and 30%, although this does not apply to all species. Some species contain more than 200% (by dry weight of the wood) in their green state. The more common would be around 100% moisture in the green.

For example, any species which contain 100% moisture in the green and which have a known fibre stauration of 25%, could be reduced in moisture either by air drying or kiln drying to the extent of 75% without shrinkage. If the total shrinkage by volume were 10% as may be determined from tables, then this entire amount would shrink in reducing the balance of the moisture.

Since a certain per cent of moisture must be left

(Please turn to page 104)

Visualizing Your Lumber Requirements

Office Specialty Co., Have Worked out Efficient System—Shows Every Foot in Stock and Where it is—Valuable Assistance to Buyer—Close Check on Slow Moving Stock

By L. R. WRIGHT

"How the 'Office Specialty' Keep Track of Their Lumber" might be a better caption for this article. It is just as necessary to know how much lumber there is in the yard, kiln and dry storage, the quantities of each individual item and how they compare with the probable requirements for the next three or six months, as it is to know how much it costs to produce a given article. More than that there is as little excuse for not keeping lumber records as there is for not maintaining accurat cost records: both are essential to the efficient and profitable operation of a woodworking plant and both enable the management to keep in close touch with the working of the factory.

One would naturally expect that an organization like that of the Office Specialty Mfg. Co., Limited, Newmarket, Ont., specializing largely in office furniture and "efficiency" office systems, would have their own plant so organized and systematized, that all details pertaining to sales, raw material, manufactured stock on hand, stock in process, costs, raw material requirements, etc., would be so tabulated and recorded that such information would be available at a moment's notice. And so they have. With the aid of a few simple forms they are able to practically visualize any phase of their manufacturing activity. This may appear to smack of over-systematization and red tape, but such is not the case. Through a wide division of responsibility, the work of recording and tabulating this information on cards and forms is so simplified and divided that it is done with little or no extra clerical help.

Weekly Lumber Report Compiled

Every week the special lumber report (Fig. 1) is compiled, showing the total quantities of various items in stock, where each lot is to be found and also the minimum and maximum requirements for 1½ and 3 months periods. Then these latter figures are based on requirements for the previous 3 months, and as a result, change from month to month as the total volume of orders increases or decreases. All this data is taken from forms filled out by various department heads.

In order to get a clear grasp of the system in operation, it might be well to start at the beginning. First a lumber record card (Fig. 2) is kept for each item of lumber used. This card gives the total quantity of that particular item in stock, including its dis-

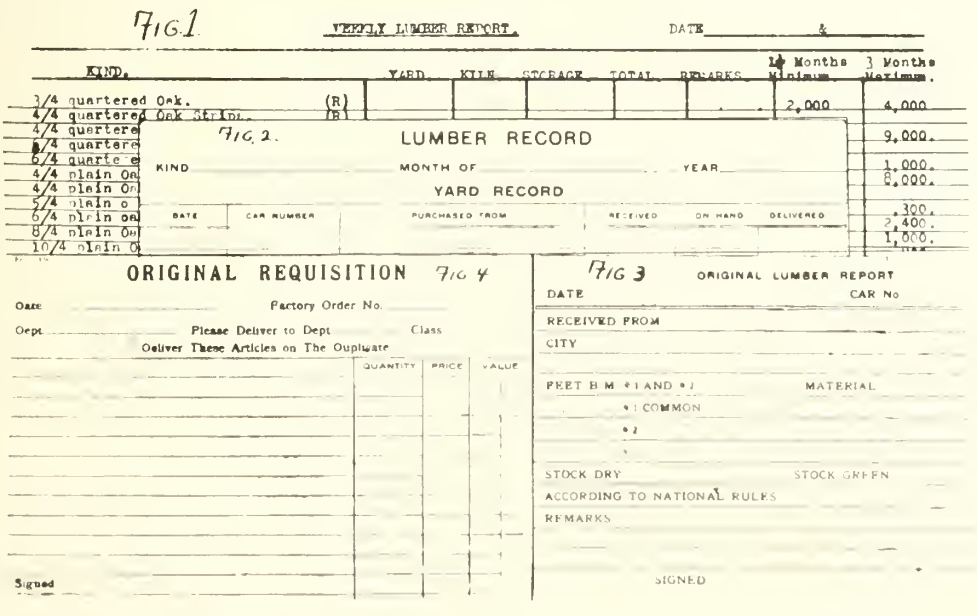
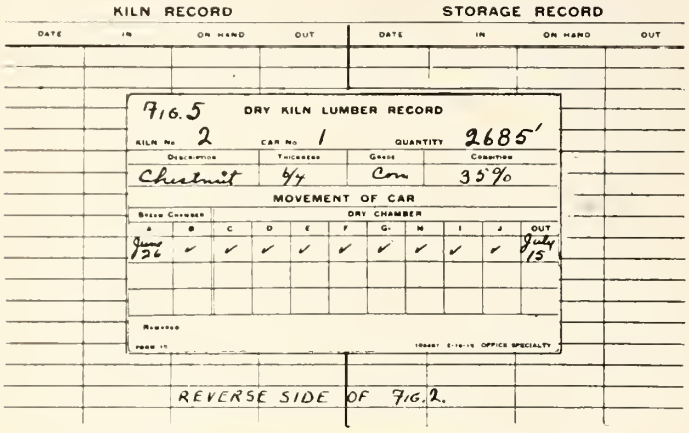


Fig. 1
WEEKLY LUMBER REPORT
DATE
KIND
YARD
KILN
STORAGE
TOTAL
REMARKS
1½ Months Minimum
3 Months Maximum
3/4 quartered Oak. (R)
4/4 quartered Oak Strips (R) 2,000 4,000
4/4 quartere 9,000.
4/4 quartere
6/4 quarte e
4/4 plain Oa 1,000.
4/4 plain Oa 3,000.
5/4 plain o
6/4 plain Oa 300.
8/4 plain Oa 2,400.
10/4 plain O 1,000.
Fig. 2.
LUMBER RECORD
KIND
MONTH OF
YEAR
YARD RECORD
DATE
CAR NUMBER
PURCHASED FROM
RECEIVED
ON HAND
DELIVERED
ORIGINAL REQUISITION Fig 4
Date
Factory Order No.
Dept.
Please Deliver to Dept.
Class
Deliver These Articles on The Ouptiware
QUANTITY
PRICE
VALUE
Signed
Fig 3
ORIGINAL LUMBER REPORT
DATE
CAR No
RECEIVED FROM
CITY
FEET B M #1 AND #2
MATERIAL
#1 COMMON
#2
STOCK DRY
STOCK GREEN
ACCORDING TO NATIONAL RULES
REMARKS
SIGNED

Showing "Weekly Lumber Report," "Lumber Report," Requisition" and "Original Lumber Report."

tribution. The information on this card is kept up to date by entering daily all lumber received and all lumber delivered to kiln, dry storage and factory.

When a car of lumber is received, unloaded, inspected and accepted, the "original lumber report" (Fig. 3) is made out by the yard foreman and turned in. This gives full particulars regarding the various items in the car and forms the basis for the entries on the "lumber record card." As different lots of lumber are placed in the kiln and from there to dry storage, a special report (Fig. 4) is made out, also by the



Reverse Side of "Lumber Report" and "Dry Kiln Record"

yard foreman, covering the movement of lumber from yard to kiln and from kiln to dry storave.

Each Foreman Held Responsible

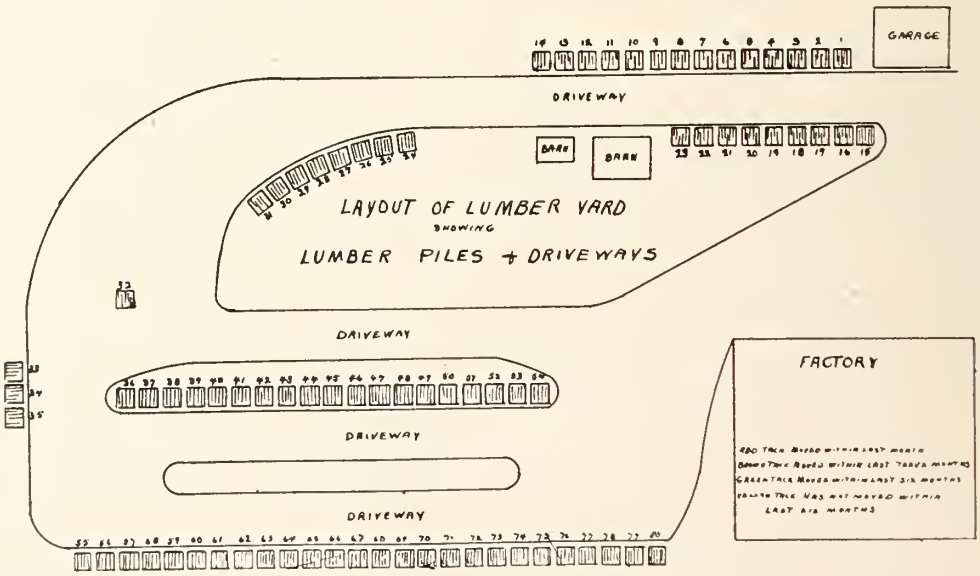
The lumber has now passed from the control of the yard foreman into the hands of the man in charge of the dry storage. This latter employee assumes full responsibility and issues the stock as required to the factory upon the presentation of a signed requisition (Fig. 5) which gives full particulars of the items required and the order number of the job for which the material is intended. After the requisition has been filled, it is passed to the man in charge of the lumber record card, who enters the amounts as delivered to factory. In order to conserve space and simplify the storing of the dry lumber, the different widths are not piled separately but are sorted as to multiples, that is 3 inches and multiples of 3 in one pile, 4 and multiples of 4 in another, and so on. This makes it easy to select stock to rip to certain widths.

The waste is calculated each month and is figured on the basis of the net requirements of the orders going through the plant and the amount of lumber brought in from dry storage on requisitions. It varies for different stocks and different articles but average in the neighborhood of 45%.

Progress of Lumber Through Kiln

In addition to the forms mentioned, a kiln lumber record (Fig. 5) is used. This serves to show how the lumber in the kiln is progressing. The kilns, which are the Grand Rapids progressive type, are long enough to hold ten cars. The dry kiln lumber record is divided into ten spaces to correspond to the car spaces in the kiln. When a car of lumber is entered in the kiln, the particulars are recorded on one of these cards and the date entered under A, which corresponds to the first cas in the kiln. As it is moved from space to space, a tick is made in the proper place on the card to indicate just how far that particular car has been moved. These cards are kept in the superintendent's office so that he is able to tell at a glance just how far along any particular car is and how soon it is likely to be ready to be taken out of the kiln. The date on which the car is taken from the kiln is also recorded which gives a check on the length of the drying period. The entry made under the heading "Condition," indicates the relative humidity in the wet end of the kiln at the time the car was moved ahead from the steaming chamber.

The dry storage is a bright airy place in which the lumber is kept under ideal conditions. It is plentifully supplied with heating pipes and the temperature is held the same as in the factory proper. As the loaded kiln trucks come into the dry storage, they are allowed to stand for from 24 to 48 hours to temper before being unloaded. As the stock in dry storage is kept under practically the same conditions as



Layout of Lumber Yard on which Colored Pine are used to Indicate Movement of Stock

re found in the factory proper, if the material has been properly dried there is no likelihood of any trouble being exprienced from warping or checking.

How Lumber Yard is Systimatized

The lumber yard is laid out as shown in the accompanying sketch. Each pile bottom is numbered to correspond with the numbers on the chart a square metal plate 3 x 3 inches, being used to indicate the number of the pile. An index is kept in connection with this chart showing the kind and size of lumber in each pile. This is changed from time to time as lumber is received or delivered to the kiln or factory. A check is kept on the lumber turn-over by using different colored tacks to indicate how long each pile has been standing untouched in the yard; for example, a red tack on a certain pile shows that it has been moved within the last month; a brown tack within the last three months; a green tack within the last six months, while a yellow tack shows that the pile has not been moved for over six months. As it is their policy to maintain a three-months' supply in stock, when it is noticed that a certain pile has been in the yard for six months or longer, the cause for this slowness of movement is investigated. It may be that the stock does not come up to grade or is not of a suitable size, etc., etc. When this is once ascertained, steps are taken to see that it is worked up to the best advantage.

This may seem like a very complicated system, requiring considerable clerical help, but when the fact that each foreman in charge is responsible for only one or two forms, it will be realized that such a system can be maintained with a minimum of effort and cost.

Are Woodworkers Inclined to Figure Low?

Majority of Estimates Submitted This Month Below Figures Kept on Job—Does This Mean That Tendency is to Figure as Low as Possible Rather Than Play Safe?—Variation in Material Excessive

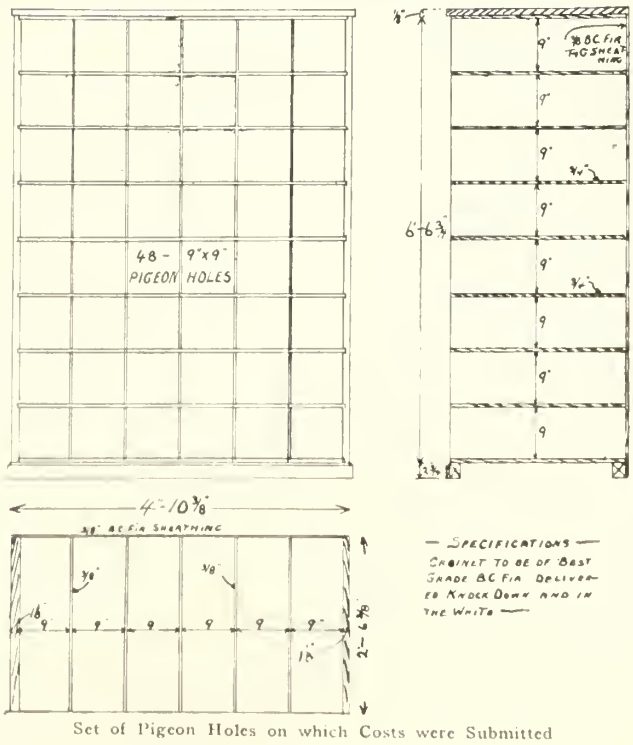
These cost articles would be more interesting and more instructive if those who co-operate would suggest how the cost could be kept as low as possible. Doubtless there are many ideas which could be applied, which would either result in a saving in material or a saving in labor. For instance, one woodworker, in submitting his estimate, has this to say,—"In practice this set of pigeon holes would, probably, cost less than we estimated, as we would glue up the upright divisions from 1-inch lumber resaw to ½-inch and dress to 3/8 inch then trim to 9¼ inches. This, to my mind, would be the correct way if one had a resaw, planer and sander that would take material 30 inches wide, but such equipment is not found in all plants. I hope my estimate is close and that I will be able to come in again in the future." (His estimate was $64.85.) This is a real suggestion and indicates how both material and labor costs may be lowered.

List of Estimates Submitted

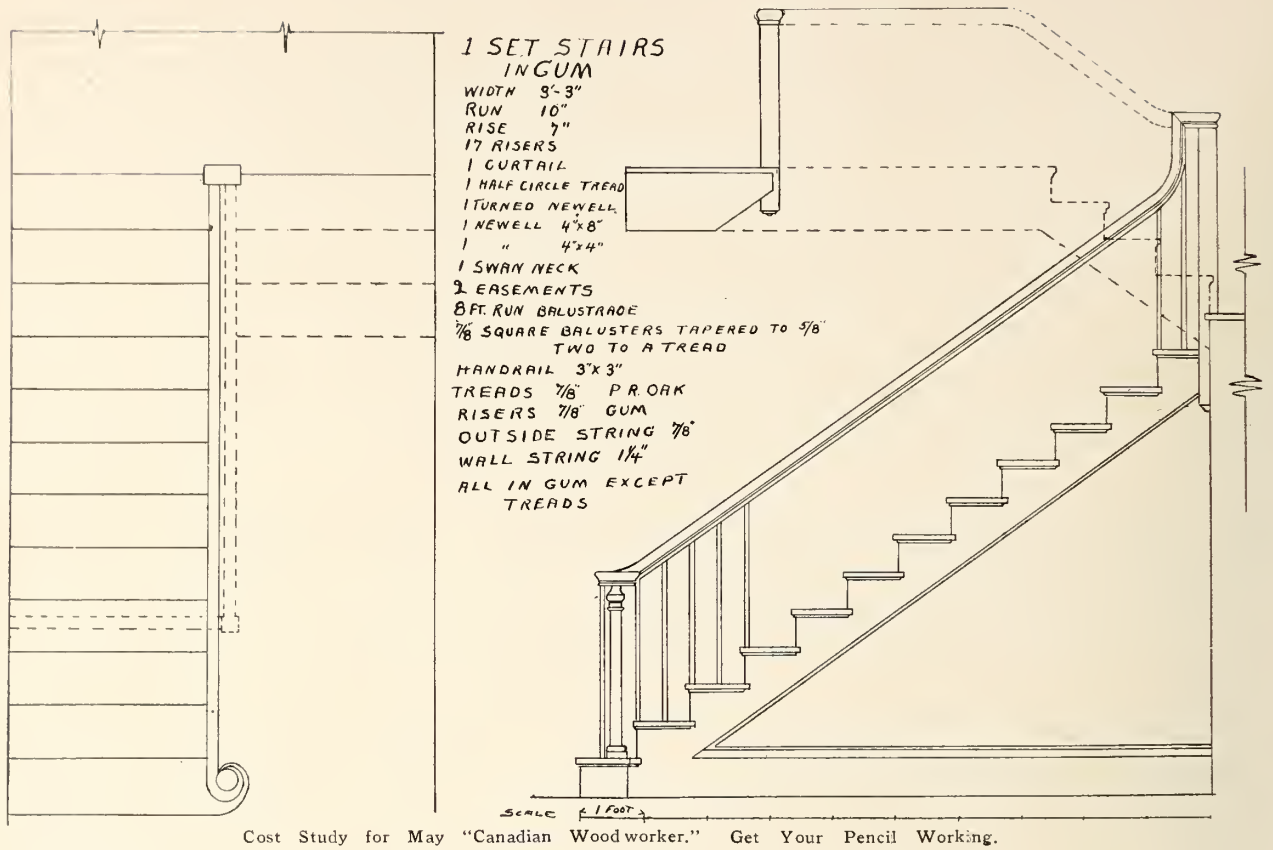
No.	Material feet	Waste	Bench	Hour rate	Machine hours	Hour rate	C. Burden %	Total
1	285	20	2	$ .85	8	$1.50	20	$51.01
2	247	15	10	.85	7	1.10	20	51.33
3	268	10	12	.70	14	1.25	20	58.40
4	308	20	15	.90	6	1.20	20	60.66
5	340	20	8	.75	15	1.50	15	64.38
6	301	25	11	.90	9	1.25	15	64.85
7	285	15	6	.95	5	1.30	20	66.25
8	315	15	5	.80	9	1.00	15	70.27
9	**304**	**25**	**14**	**.90**	**15**	**1.20**	**20**	**75.80**
10	264	15	9	1.00	12	1.25	20	79.08
11	310	15	7	.65	14	1.50	15	83.00
12	241	20	12	.75	10	1.35	20	87.65
13	295	10	7	.70	9	1.40	20	89.15
14	286	25	16	.80	13	1.30	15	91.20

A glance at the list of estimates submitted this month show that the majority of the figures sent in are below the actual costs as submitted by the party who filled the order. It is possible that his figures are higher than the average or above what they should be. This brings out another point. Why not make a prictice of criticizing, constructively of course, anything with which you do not agree. If you think certain figures are too low or too high, do not hesitate to say so and give figures and facts to back up your opinion. In this way we will get much further with our cost studies and gain more from the data published than if everything is accepted as gospel truth. Such constructive critisisms need not be confined to the cost articles alone but could apply to anything published in any issue of the "Canadian Woodworker."

The surveys of material do not show as great a variation as in some of the other studies though the difference between high and low, 241 feet and 340 feet, is 40%. This is far too great. The amount of material required to make any article should not show a difference of more than 5 to 10% when figured in different shops. This is particularly true in connection with these cost estimates as the quantities are



Set of Pigeon Holes on which Costs were Submitted



Cost Study for May "Canadian Woodworker." Get Your Pencil Working.

net, with the waste allowance to be added. Strictly speaking, the net feetage of any job should figure the same, no matter where or how calculated.

Coming to the waste column, the most noticeable feature is the number who have allowed 15% and under. Five estimate 15% and two make an allowance of 10%. These figures are undoubtedly too low. An accurate check on all material used would show that the waste seldom runs below 20% and from that up. As a matter of protection it would appear to be the part of wisdom to always figure at least 20% waste. This may seem a small item but often it means a difference between profit and loss.

Material	Details of actual cost	
259 ft. Fir @ $90.	$23.30	
40 " ⅜ Sheathing, Pine @ $60.	2.40	
5 " Common Pine @ $75.	.35	
	26.05	
Waste 25 %	6.51	$32.56
Labor		
Machine, 15 hours @ $1.20	$18.00	
Bench 14 " @ .90	12.60	$30.60
		$63.16
20 % Commercial Burden		12.64
		$75.80

The rates per hour for bench and machine labor are included this month. These figures are not the actual amounts paid but cover an allowance for factory overhead. The firms figuring 65 cents per hr. for bench labor and $1.00 per hour for machine labor either do not pay their employees any too generously or they do not allow very much for overhead. This latter allowance should include such expenses as supervision, indirect labor, power, heat, light, insurance, taxes, interest, depreciation, supplies, repair and other items of a similar nature. The Millwork Cost Bureau of Chicago, have found that the average machine burden based on figures taken from 500 plants is 57 cents per hr. and the bench burden 34 cents per hr. Take 34 cents from 65 cents and it looks like a wage of 30 cents an hour for skilled cabinet makers.

The commercial burden column shows a few 15% allowances. Commercial burden is used to separate administrative, management, sales and service expenses from those directly chargeable to the factory operation. The items included under this heading are office expenses, selling and advertising costs, salary of manager and office staff, delivery costs and similar expenses. The main reasons for separating these items are to keep track of the cost of doing business so as to be able to compare it with the total value of the output of the factory and also to determine whether or not it is more profitable to manufacture certain stock items or to buy them on the open market. If the prevailing prices were below the manufacturing cost without the addition of the commercial burden, the items in question could be purchased and handled to better advantage than if they were made in the plant.

The total costs seem to run in groups this month. Two estimate in the vicinity of $51.00, three run near $65.00 and three are around the $88.00 mark. As the general average is below No. 9, the actual cost, it raises a doubt as to whether or not this is too high. The variation is out of all reason as usual.

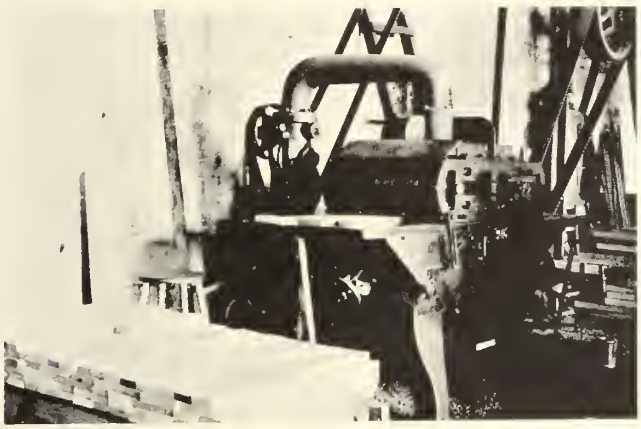
The subject selected for next month is a set of stairs. This is a real test and should bring out a record number of estimates. It affords Canadian members of the Millwork Cost Bureau an opportunity to work in their application of Cost Book "A" and compare the results with the ideas of stair costs held by non members. If everyone co-operates the cost studies in the May issue will be an outstanding feature, and by including practical suggestions and a discussion of details and methods, it will contain much information of real practical value. Will you do your part?

Two Boys do the Work of Four Men

Reduced Labor Costs and Increased Production With Labor-Saving Equipment— Self-Feed Jointer Working Economies in Many Plants— Greater Safety Secured

The jointer or buzz planer is one of the most versatile machines to be found in a woodworking plant. In skilled hands it can be used for a wide variety of operations, such as jointing, straightening, rabbeting, beading and running simple moulds. Like other machines, it is not perfect but has its drawbacks, disadvantages and limitations, two of which are low productiveness and danger to operator.

That this is not a production machine was fully demonstrated when it came to straightening and facing large quantities of either wide or narrow stock. If you keep a man shoving work over the cutters all



Feed Attachment on Jointer in Hanover Plant

day long, and not only will the job become very tedious but the amount of stock put through in a day's run will not be any too satisfactory. If the quantity of material to be straightened each day is very large, three or four buzz planers may be required, requiring an equal number of operators and a considerable amount of floor space. It was just to overcome this condition that the power feed jointer or under-cut planer was placed on the market.

Higher Production Secured

The development of the power feed jointer has proceeded along two lines,—one the perfecting of feeding attachments which may be used in the ordinary type of buzz planers, the other the perfecting of special power feed jointers or straighteners. In both of these types of equipment, safety to operator and high productiveness are outstanding features.

In the first class, power feed attachments, special feed works are carried on a separate column or on an arm attached to the base of the machine. This attachment is so designed that it may be swung clear of the jointer when other forms of work are being handled or when knives are being sharpened or ground. This really makes a combination power feed jointer and buzz planer. The feed works are so constructed that they can be readily raised or lowered to accommodate material of different thicknesses.

The special self-feed jointer or, as it is sometimes called, the under-cut planer, is designed primarily for production work on straightening and facing wide and narrow stock. The feed works, which practically cover the full surface of the two beds, are supported on four columns. In this way the feed mechanism is always in perfect alignment with the bed of the machine. It is usually constructed to take care of the variation in the thickness of stock going through and will handle a difference of $\frac{3}{4}$ inches without changing three or four hand feed machines and as no particu- the set. As far as output is concerned, it is equal to lar skill is required and as practically all danger is eliminated, may be operated by two boys, effecting a desirable saving in labor costs.

A number of Canadian woodworkers were approached with a view to ascertaining their experiences with this machine. The replies received were, to say the least, enlightening. One well-known panel manufacturer writes,—"The round cylinder head with high speed knives, together with the self-feed attachment, allows the operator to keep the machine full to capacity at all times. The feed adjusts itself to the thickness of the board so that boards varying in thickness

Self Feed Jointer in Plant of Chesley Furniture Co., Chesley, Ont.

as much as $\frac{1}{4}$ or $\frac{1}{2}$ inch may be put through at the same time. The adjustments are so simple that an inexperienced man can learn to operate the machine in an hour. There is no question but that production is increased and cost cut down. A man and a boy can do as much in eight hours as one man could do in sixty hours on the ordinary buzz planer."

A furniture manufacturer has this to say,—"We are very well satisfied with the performance of our under-cut planer. Its output is equal to four ordinary buzz planers and does not require a highly skilled

operator, while the quality of the work is all that could be desired. We find it entirely eliminates buzz planer accidents, and have come to the conclusion that in the manufacture of furniture this machine is an absolute necessity.

Another manufacturer, specializing in store fixtures, replied as follows:—"I may say that previous to installing this machine I had no end of trouble with work piling up and seemingly could not get it past the buzz planer fast enough to keep the rest of the department going. After I put in an under-cut planer this difficulty was overcome, so much so that I am using one man less in this department with much better results."

Other Economies Effected

While both the special under-cut planer itself and a buzz planer, equipped with feed attachment, are capable of turning out a large volume of straightened work in a day's run, yet it goes without saying that the special self-feed jointer will handle more and heavier work than a buzz planer equipped with feeding attachment, but either type of machine will turn out as much work as from two to five hand-fed machines. This means that two savings are made, one with regard to labor, as two men or two boys will do as much work as from three to five men under ordinary conditions, and in addition there is the saving in space. In the larger plants the self-feed jointer has not entirely replaced buzz planers as usually one or two are retained for handling edge work and for special detail jobs.

An idea of productiveness with this equipment may be gained from the fact that feed rates from 25 to 40 feet a minute may be carried and that the full width of the machine may be utilized all the time.

How Can We Operate Profitably?

Laidlaw Lumber Co., Find That Frequent Meetings of Staff and Key-Men Improves Team Work—Many Practical Ideas Brought Out—Minutes of Meeting Showing Range of Subjects Covered

Woodworking plants are to-day confronted with the problem of "How can we operate profitably?"

Efficiency will give us all the advantages obtainable, but to be in possession of efficiency, we must be thoroughly organized. To obtain the desired results, we must have loyal co-operation, and the latter can only be developed by open and frank discussion of the many problems arising from day to day. By this expedient, perfect team work accrues, friction is reduced to a minimum, order is brought out of chaos and loss turned to profit.

To bring out and develop this team work or uniformity of action, different firms resort to various methods; some by way of suggestions sent in from time to time; others by bulletins or house organs, whilst others have periodical meetings of all the executive or keymen and frankly discuss the many problems arising. The latter method appeals to me as the most practical, and is the one used by my own firm. It commends itself in many ways.

It is possible for a body of men to work together day by day for many years and yet be comparative strangers, but meeting together at short intervals to discuss frankly every-day problems, will break down any barrier, create comradeship and generally inspire an atmosphere of co-operation and confidence.

No one man possesses a monopoly of ideas. We find that, by meeting together in this way and exchanging views, we can pool our different ideas, adopting those of merit, and rejecting the others. The result is obvious and the effect can be seen in every operation. We have elevated these men from merely order takers or operators to a position where they take a vital interest in our production and other problems, and it is, indeed, surprising the splendid suggestions that accrue from the most unexpected sources.

Hold Executive Meetings Monthly

We hold what is known as a general executive meeting every four weeks. This embraces the whole of our Toronto organization. Then, intermediately, we hold a local executive, so that we have a session of some kind every two weeks. At the former, we discuss things of general interest, such as trade conditions, quotations, credits, in fact we take a wide range endeavoring to cover in a general way all matters of vital interest. At our local meetings, we try to confine our thoughts to such problems as may occur within our range of operations, more especially those within our own plant.

The results are gratifying and are briefly as follows:—The speeding up of production; general co-operation; the movement of slow-moving stock; creating an atmosphere of loyalty, etc.

I append samples of minutes, extracted from our minute book, which will be more eloquent than any explanation.

Minutes of previous meeting read, accepted and signed.

Advertising being the subject discussed at the previous meeting, the chairman called for further discussions on this point. The previous minutes were finally analyzed and it was decided that each member seriously consider the matter.

Harris, that Mr. Shillinglaw gather up the information

Moved by Mr. E. Griffiths, seconded by Mr. F. re garage buildings—Carried.

Moved by Mr. McDowell, seconded by Mr. Shillinglaw, that each person submit a suggestion on advertising—Carried.

The chairman again called the committee's attention to production. He referred to a letter sent out by him to the men on this subject, and further emphasized the vital importance of this matter. He also intimated that he intended calling the men of the plant together and giving them a talk on the topic.

The agenda was then taken up and the first point as to congestion was discussed.

It was admitted such congestion existed, that the 12-inch sticker and jointer were in such positions as to cause delays in setting up and production and also a trap for accidents. This matter was promised con-

sideration by the chairman, and prompt attention where possible would be taken.

Moved by Mr. Griffiths, seconded by Mr. Chamberlain, that the jointer be removed to a position named at a later date—Carried.

Moved by Mr. Chamberlain, seconded by Mr. McDowell, that the power feed saw jointer and 8-inch sticker at the old plant be investigated as to their being suitable for the mill—Carried.

Moved by Mr. McDowell, seconded by Mr. Blacklock, that an explanation regarding the capacity of the mill by the manager be accepted—Carried.

Moved by Mr. Chamberlain, seconded by Mr. McDowell, that a millman use duplicate order blanks for his requirements, and that said orders be immediately acted upon by the manager—Carried.

Moved by Mr. Griffiths, seconded by Mr. F. Harris, that the pony planer for the mill be investigated immediately and considered at the next meeting—Carried.

Moved by Mr. McDowell, seconded by Mr. Blacklock, that the mill windows be cleaned and that the millmen report regarding illumination in the mill and place the same on the order blank—Carried.

Moved by Mr. McDowell, seconded by Mr. Chamberlain, that information regarding the cost of putting work through the mill, be available to millmen at the end of each month—Carried.

Moved by Mr. McDowell, seconded by Mr. Shillinglaw, that the east yard and the west factory complete the agenda for the next meeting, Thursay April 7th, 1922—Carried.

Composition of the Executive

An executive should consist of the following men; manager, superintendent, foreman, shipper, office staff and other leading or keymen.

The only officers necessary are the chairman and secretary, but that the work of the executive may be effective, these officers must perform their duties faithfully, because business once discussed and passed, unless properly recorded and executed, is useless.

A good rule to adopt is, at given periods, to have a re-capitulation of all business done and thereby see if the recommendations have been carried out and the anticipated benefit derived.

Our executive has been in existence nearly three years, and I have been frequently asked "does the interest waver?" My reply is that enthusiasm has never run so high as at present. At each meeting, we discuss some new question with our men. The logical way in which our problems are reviewed and disposed of is a revelation.

The executive has amongst other things formed a fire squad under the leadership of our factory superintendent. The squad being made up of hand-picked men, it necessarily gives us a fine body of fire guardians.

We also have a vigilance committee to prevent accidents. It is the duty of these men to warn careless employees of the danger of certain operations, and if any accident does occur, to see that it is properly attended to by a doctor; and during the stages of convalescence, to visit any injured employee, making sure that he is receiving proper care; and that he himself is doing all that is possible to bring about a speedy recovery. These are a few of the things that we discuss.

We place special emphasis on the elimination of waste in all its different phases, and the way our men endeavor to use up every vestige of material is gratifying.

Another live question is that of production,—trying to devise ways and means of speeding up, and it is surprising the time that can be saved when the whole staff operate as a unit. This is co-operation.

Closer Attention to Fine Circular Saws

Satisfactory Results Demand Well Fitted Saws—Have You Provided Well Equipped Filing Room—Many Dollars Wasted Through Careless, Inefficient Filing Methods

By H. A. RALPHE

I had the opportunity to go through a furniture factory a short time ago, and while it seemed to have the very best machinery for the work it was doing, I regret to say that I found the filing room in connection with the engine and boiler room, and one man was engineer, fireman and trying to be the filer. I wonder how many extra five-inch resaws and scroll saws that company has purchased since it started operations five years ago. By the looks of the broken saws it certainly must be a large number.

The location of the filing room should be as readily accessible to the different wood-working departments of the mill as possible. The features of ample size, abundant light, heating, and also ventilation, cannot be profitably ignored, but it is in these respects that the majority of wood-working plants are extremely lacking. These defects work positive loss in time, and the practical fitting of the saws, and I believe every hundred dollars spent intelligently in the construction of a filing room and its equipment will yield a larger per cent of profit on the investment than double such expenditure in any other department of the plant.

The saw stretcher and anvil bench where band resaws and circular saws are hammered and tensioned should have a north light, with no side lights that will interfere with the filer's tests of the saw with tension gauge or straight edge. In a good many sawmills the use of skylights for admission of light on sharpening and grinding machinery proves both satisfactory and desirable, and why shouldn't it be just as essential in the wood working establishments where the saws, as a rule, are of much finer nature? Spring set and hand filing have no more place in a factory than in a sawmill, except on such saws as are used for crosscutting, or which form the fine character of the teeth and cannot be swaged successfully.

A full swaged tooth is the only tooth to run on any kind of a rip saw. A well-rounded saw, with teeth swaged and properly side dressed, and with proper

pitch and clearance for the dust, is a combination unsurpassed. Any kind of a round saw, such as edgers, bolters, lath and shingle, barrel stave and veneer saws, solid and segment rip and resaws, run with a swaged tooth, will do more and much better work than if fitted by hand with spring set. It may be claimed that the hand filing and setting are simpler and require less skill on the part of the filer than the use of an emery-sharpening machine and a saw swage, and this is true to a certain extent, but no one will argue that there is a profit in crude, inferior saw fitting, or that the factory saw filers are not disposed to progress and improve the character of their work. If a higher grade of work is demanded, there will be found men to meet the advanced requirements, and a man of fair ability can do so if given the proper tools to work with.

A few factory operatives have considered that any kind of a roustabout could fit their saws well enough, and really consider a cheap man and a file to be a complete filing room outfit. Some have furnished an upset, swaging hammer, a bench grinder, and a T-rail for an anvil, and some still more progressive, and quicker to see the advantage arising from the use of finely fitted saws have furnished rooms of proper size, well lighted and equipped with sharpener, swage, hammering outfit, knife grinder, and other tools necessary and adapted to the various requirements. A good saw fitting equipment well-suited to general wood-working plants may be obtained for a reasonable outlay, and it will save its cost several times a year over inferior tools or an absence of tools.

Dull saws and rounded corners cost the operator a good deal more money than a well paid, competent filer. To put a cheap man into the filing room is one way to lose money. Again, cheap tools and machinery are not good, and good tools and machinery are not cheap. It not infrequently happens that as between two machines for filing room service and also for wood-working purposes, the price for one may be from 50 per cent to 100 per cent higher than the other. You may rest assured that in almost every instance you get just what you pay for.

Filer Should Specialize

It is doubtful whether the policy practiced in some mills and factories of making the filer a general utility man, liable to interruptions and calls upon his time for duties entirely outside his regular work, is a good one. Thus in some factories the filer is expected to keep up a lot of machines, keep up an engine or two, take care of a lot of belting, do filing on saws that require the very finest and most skilful treatment, and do all this perhaps with an outfit of odds and ends, when, in fact it couldn't be done with the very best of filing machinery. Certainly it is a fact that a factory filer who is thoroughly competent deserves as much pay as he generally gets.

Keep your saws jointed so every tooth touches the jointer, and you will have a round saw with each tooth performing its portion of the cutting. Understand that fine work from any kind of a saw depends mainly on the fitting and the way it is benched. Maintain teeth not too long nor too short, but according to the work being done---also round, and nice round throats. The stock should be fed to any saw so that the teeth will take a deep, full cut rather than a light scraping one, as they will stand up to the work with less tendency to dull. I have often observed in sawing dry hardwoods that the saw is dulled in a short time, and this can easily be traced to improper feeding.

There are conditions of excellence that must exist in the machines on which saws are to run always requisite to the successful operation of the saw, however well fitted, and it is presupposed that every saw arbor is level, and in line with the table or carriage, and runs without end play, or lost motion in the boxes, and especially that the mandrel hole in the saw fits the arbor, and arbors run cool, etc., otherwise the best fitted saws will not be able to do good work.

How to Reduce Freight Costs

The movement on foot to promote the more general use of ready-cut small dimension stock is gaining momentum. Increased interest in this problem of such vital importance to all manufacturers and consumers of the raw forest material is being exemplified by numerous progressive firms among all the various wood-using industries. As a fundamental step the U. S. Forest Service, through its Forest Products Laboratory, Madison, Wisconsin, has been gathering first hand detailed information during the past eight months on the waste occurring in the production of dimension stock at woodworking plants, together with actual costs of such production.

It is, of course, quite generally known that in present practice a majority of the wood-using industries are required to purchase their raw material in the form of previously manufactured lumber. After bearing the excessive cost for freight on the material from the lumber manufacturing centres, the consumers must recut this lumber, not necessarily manufactured in sizes or shapes at all suitable for their particular purposes, into the small stock required in the fabrication of their wood products. Thus, the manufacturers must not only pay for the additional cost in cutting the required clear stock from this lumber and pay a lumber rate on the defective material not suitable for the small stock, but also must pay excessive freight charges on the defective material which is disposed of as waste. It is obvious then, that in best practice this small stock required by the chair and other secondary wood-using industries should be manufactured

Taxes and Capital

Opponents of capital must learn that enactment of a high progressive surtax in the income tax law was like the victory of Pyrrhus. Beginning at $5000, the rate increases until it becomes confiscatory for large incomes. If a man invests in a productive enterprise and receives an income of $500,000, the government takes $303,190 of it. If he earns $1,000,000, he can retain only $336,810. Should he earn $2,000,000, the government would take $1,393,000, and leave him $608,-100. Courts hold that capital is entitled to a fair return. For two seasons the Soviet took the peasants' grain from them, and at the third season they refused to plant except for their own needs. Now, Russia is starving. Take away the incentive of a return and capital will not be risked in industrial enterprise. That is why new promotions are falling off so rapidly. Capital is industry's life blood, but the surtax is a halter around its neck to strangle it.---Barron's Weekly.

Differential Price List for Boxes and Shooks

The Millwork Industry has in Cost Book A of the Millwork Cost Bureau a Basic Price List for Made to Order Millwork—Would Basic Price List Assist Box Manufacturers in Quoting on their Product?—Subject for Discussion at Annual Meeting of National Association of Box Manufacturers

By H. L. Pease, Secretary

Many products used in the course of manufacturing boxes and shooks are purchased by the box manufacturer on a percentage of a list price, as belting, nails, wire and steel goods. The price to the buyer varies as the discount of the list varies. In the wood box industry, the general price quotation is on either a per-box unit or a per-M-feet unit. A base price method from which various discounts are taken, has been successfully used by a small group of box manufacturers.

Benefits Which Would Accrue

While the Differential Price List should not be confused with a Cost Accounting System, it would in reality materially assits factories that do not know the cost of producing various boxes. A factory that can sell a textile case or a canned food box for a certain figure, and these we might term their "pet" boxes would after years of experience know at what price either of the boxes referred to could be sold and net a certain profit. It is safe to say that every box manufacturer has some "pet" box he makes and taking experience of a period of time, knows what price to charge in order to make a 10, 15 or 20% profit. The same manufacturer receiving an order for say, 100 boxes of different dimensions would not know unless he had accurate Cost System, the price to charge to receive approximately the same percentage of profit as was being made on the "pet" box. Such a factory could use the Differential Price List, figure the discount on his "pet" box that would net him the desired profit and by applying the same discount to all other orders, receive approximately the same percentage of profit.

Possibly the reason why such a price list has not been given wider application is principally on account of the differences in materials used in various districts. The wood box industry is working with a varying commodity and for that reason it might at first appear to be somewhat difficult to arrive at a base price upon which discounts would be applied to meet the conditions in various factories and districts.

Small and Large Boxes Cost More

The theory of the base price list, known as the Differential Price List, is that it costs more to manufacture a small box than it does one of the average size, and that when the size of the container is increased beyond a certain point the production cost rises. The Differential List was compiled from the experience of a number of factories, and the figures were compiled from a curve, the start of which first represented costs of the smaller boxes, the curve slanting downwards representing lower costs in the manufacture of ordinary-size cases. After passing that point it gradually had an upward trend, showing the cost of the unusually large boxes. A manufacturer using the list would have to determine his individual discount and the discount would vary according to the kind of lumber used and would vary with each manufacturer. This on account of the differences in production costs in different factories. To illustrate, on account of this difference in lumber price, it would be necessary to have a different discount to apply to White Pine from that which would apply to Hemlock. It would be necessary to have a different discount for hardwoods from that which would apply to softwoods. It might be necessary to have a different discount for all 13/16 from that which would apply to a resawed box, as there is usually a spread between the selling price of all 13/16 boxes and re-sawed boxes.

The use of the Differential Price List will bring to the seller's mind the various extras which so frequently go into a box, printing, corrugated fasteners, cleating, quantity orders, selected stock and other details enumerated in this paper. The correct application of the price list will assure the manufacturer that he is paid for all of these extras.

Simplifies Price Making

Many factories will to-day quote a price on the per-M-feet basis, regardless of size or thickness. It is true that the application of the price list will mean that each individual box be given consideration and its feetage determined, but can a man devote time to better advantage, inasmuch as it would mean a more accurate knowledge of cost and profit to the manufacturer?

By re-arranging the card index record of customers' boxes and by showing on each card the list price of the box or shook, it would mean that when the index is finally established it would never be necessary to again refigure the sizes, for the list price never changes. In the future, after such change had been made and a request would come for the price on a certain box, assuming that a card for that box is in the file, it would only be necessary to apply the manufacturer's discount which he happened to be using at that time to that price in making quotation, and by applying that discount, the manufacturer would know, without any question or doubt, that, he was making approximately the profit he figured.

In looking ahead in our Association activities, it may be possible that sometime we shall be able to establish a Uniform Sales Report which would apply quite generally throughout the country. Such a report would to-day be of little use in that the information collected and disseminated would necessarily have to be based upon the per-M-feet basis, which as every manufacturer knows, is somewhat misleading, for a quotation of $50.00 per-M-feet might seem somewhat higher or net a larger profit than a quotation of $45.00 per-M-feet, while in reality there may be so many extras on the $50.00 price that the profit to the manufacturer selling the $45.00 order would be greater than that of the $50.00 order. The use of the Differential Price List in the Compiling of statistical matter would eliminate that difficulty, for it would make no difference as to the extras, for two men might sell at 40% of the list and when the figures

were reduced to board measure one might receive $45.00 and the other $50.00, the various extras enumerated in this accounting for the higher price.

There probably has never been so simple or so accurate a system devised for the quotation of shook prices, for once the card index is developed anyone in the office from the office boy up, who can multiply one figure by another, can quote a price, for it is but necessary that the one in charge of price quotations in each plant fix the discount for his plant and anyone can apply that discount to any box, and the manager will know that the price nets a certain profit.

How to Secure List Price

Find the surface measure for each pair of parts: viz., two sides; top and bottom; ends and cleats (if any). Use the Official Box Estimator adopted by the National Association of Box Manufacturers. After securing the surface measure for each pair of parts refer to the Differential Price List, placing on figuring sheet the list price for each pair of parts.

Rules for Disposition of Fractions

Feetage fractions of less than .024, omit.
Fractions of .25 or greater, but less than .75 stoti. as .5.
Fractions of .75 or greater, increase to the next whole number.
Illustration:

3.823 feet treat as 3.80 feet
6.367 feet treat as 6.35 feet
7.081 feet treat as 7.10 feet

Ascertaining the List Price

Size 30" x 18" x 16½"
Style 1 13/16"

Cutting Size		S. M.	List Price
Sides	31-5/8" x 16-1/2"	7.247	$47.39
Top & Bottom	31-5/8" x 19-5/8"	8.709	56.24
Ends	18" x 16-1/2"	4.125	27.77
		20.081	$131.40
3% of list for bundling			3.94
List Price per 100 boxes			135.34

To Ascertain Discount to Apply to List Price

We will assume that the foregoing box is the "pet box" referred to in the introduction and that with lumber, labor, overhead and supplies costing a certain figure the box manufacturer knows he can sell it on the basis of $41.75 per M ft. and make 10% profit. In arriving at a discount the BOARD MEASURE is used instead of surface measure. In the example on account of the box being constructed of 13/16" material, the board and surface measure is the same. (The total, 20.081 ft. can be termed as board or surface measure.)

Divide the list price by the feetage (board measure) gives price per M ft. list.

$135.34 divided by 20.08 ft. is $67.40, List price per M ft.

To arrive at the discount of the list that will give approximately $41.75 per M, divide the selling price ($41.75) by the list price per M ft. ($67.40.)

$41.75 divided by $67.40 = 62%.

The percentage of list to give approximately $41.75 per M ft. (board measure) is 62%.

By applying that discount to all other boxes regardless of size,style or extra operations the profit will be approximately the same and it is not necessary to change the discount until there has been a change in costs.

Discount Applied to Resawed Box

The cost of manufacturing a resawed box is somewhat greater than the cost of manufacturing one of 13/16". It also costs more to manufacture a style 4 than it does a style 1.

Resawed Box Example

Size 30" x 18" x 16½" Style 4,
13/16" Ends and Cleats, cleats 3"
Sides, Top and Bottom 3/8"

Cutting Size		S. M.	List Price
Sides	33-1/4" x 16-1/2"	7.620	$25.18
Top & Bottom	31-5/8" x 18-3/4"	8.236	27.19
Ends	18" x 16-1/2"	4.125	27.77
Cleats (see note)	17-1/4" x 6"	1.438	10.06
Cleating (nailing charge)			1.80
			$92.00
3% of list for bundling			2.76
List Price			$94.76

Nate: In the illustration (a style 4 box) there are two cleats on each end, each 17-1/4" x 3" or four cleats on the box. In the interest of simplicity in using the Differential List the two cleats on each end are considered as one piece 17-1/4" x 6".

62%of $94.67 = $58.70 per 100 boxes, Selling Price
Board measure in above example 13.49 ft.
$50.70 divided by 13.49 ft. = $43.51. the price per M ft.
Selling price for Style 4 resawed $43.51
Selling price for Style 1, 13/16" 42.00
Difference in price $ 1.51

The difference in price is the usual differential between cost of manufacturing a resawed box over one of 13/16", but considering that the "spread" in selling price is usually greater it is quite possible to have one discount for 13/16" and another for resawed. The discount would not be the same for all White Pine boxes and boxes made from cheaper lumber.

The Differential Price List will carry tables for the following thickneses 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", 3/4" and 13/16". Each table carries Gross prices for each pair of parts for .10 ft. to 29.95 ft., surface measure.

New Course on Estimating

The Millwork Cost Bureau, of Chicago, have just issued a new Estimators' Correspondence Course as a service to members. This is one of the most valuable and comprehensive courses of its kind which has ever been offered to woodworkers. It consists of work on five sets of plans and includes the taking off of quantities and the application of Cost Book "A," which is the basic cost list issued by the Bureau, to the special millwork required for these structures. The student is thus given a thorough grounding in the reading of plans, the taking off of quantities, in making out lists of material and in the figuring of costs through the application of Cost Book "A".

The course is open to members, who may enrol as many of their staffs as they like without extra charge. When the work has been covered in a satisfactory manner and the Bureau is satisfied that the student has a thorough grounding in the various phases of estimating and costing covered, a certificate or diploma is issued which indicates that the student has mastered the Millwork Cost Bureau's system.

A simple appliance can be used to put on the mouldings or boards as they go through the machine to tell how many feet has been machined during the day.

Volume of Residential Building Increasing

The building industry is so closely allied with the woodworking and furniture manufacturing industries that it may be used as a barometer to indicate what may be expected in the two latter fields. As conditions improve in the construction field, it is bound to have a beneficial effect on woodworking in general and to result in a stronger demand for wood products of all kinds including furniture and even phonographs and pianos. This is specially true when the trend of building development is toward an ever-increasing volume of residential work. For this reason the woodworking and furniture industries can take heart from the way the building industry is opening up in the early months of 1922.

In the residential field contracts were awarded in January 1922 to the value of $2,363,700, according to MacLean Building Reports, Limited. This increased in February to $4,049,200. and in March showed a still further advance to $5,930,800., or a total of $12,343,700. for the first three months of 1922. It is only when we compare this figure with those for other years that we are able to determine just what this may mean. During the first three months of 1919 the total volume of residential work awarded was $4,250,000. The figure for 1920 was $8,750,000., and the same for 1921. It will, therefore, be seen that the total for January, February and March 1921 is three times as large as for the same period of 1919, and 50% greater than for the corresponding periods of 1920 and 1921.

The value of contracts awarded for business blocks does not compare quite so favorably with past years, though it is 50% greater than 1919, but is considerably under 1920 and 1921. During January ,February and March 1922, contracts for business buildings which include stores, office buildings and warehouses, are given at $9,590,400.

In commenting on the probable trend of building activity during 1922, MacLean Building Reports, Limited, Toronto, have this to say,—"On every side are indications that there will be a sound volume of new construction for the year 1922. The volume of contemplated new work reported in Canada during March amounted to $23,773,100., while the total value of contracts awarded during the same month was $13,465,000., as compared with $10,718,000. in February and $10,256,700. in March 1921. Residential building accounted for 44.6% of the March total and business building amounted to 39% of the total. A significant feature of the March construction record is the increase in business buildings over February. During February the wholesale price index of 48 building materials advanced slightly and is now 89.2% above 1913, compared with the peak of 183.8% reached in May 1920. Prices of building materials have now declined 51.6% from the highest point reached."

How Chair Manufacturers Keep Down Costs

The fabrication, into small rough stock of low grade lumber produced in such relatively enormous quantities at every hardwood sawmill and even the use of wide edgings, thick slabs, and long trimmings for this purpose is to be the newest development and one of most wide reaching effect in the wood working industry. In the work now being conducted by the Forest Products Laboratory along these lines, some remarkable information is being collected in the chair industry. For instance, it has learned that certain chair manufacturing companies, who are noted for their low production costs and economical use of raw material, attribute their success to the wide use of small rough dimension stock cut to meet their requirements and to material purchased in semi-finished form ready for the sanding and shaping machines. Upon further investigation the Laboratory has ascertained information that these particular materials have, in a majority of cases, been produced entirely from low grade lumber and sawmill by-products such as slabs and edgings which otherwise would have been disposed of as waste. In spite of these facts, this material bought by these chair companies in a ready-cut or semi-finished form has been of as good, and in some instances, higher quality than that which could be produced from lumber at their factory. Much other information of the same nature is gradually being assembled and it all points to the practicability of the more extended use of small dimension stock in the chair and other wood-using industries.

The work by the Laboratory crews on intensive studies at chair factories throughout the United States continues. In all, studies extended over periods of about 30 days each have been made at nine different chair factories. In these studies the members of the crew actually tally the dimensions and grade of all lumber going across the cut-off saw and through the rip saw, and the resulting products of these two operations. In addition they are collecting information on the relative cost of band sawing versus the bending of curved chair parts. Soon the crew will move to western Pennsylvania for one of two additional studies.

After a careful survey of the different classes of conditions existing throughout the chair industries, the Laboratory believes that the data obtained in these 11 or 12 studies will be truly representative of the entire industry. The general report which is to be a summation of the statistics, cost information, waste data, etc., collected in all these studies, will be published as soon as the mass of figures can be worked up.

Keeping Down Manufacturing Waste

The first step in an endeavor to reduce waste is to ascertain the cause; in fact some consider that waste reduction is largely a matter of turning the limelight on the cause and then applying the logical remedy.

Before any attempt to reduce waste can be entirely successful, it is necessary that the full co-operation of all employees concerned is first secured. In some plants a bonus system has been worked out whereby employees benefit in proportion as they are successful in keeping the waste percentage below certain standards. Another suggestion that has worked out advantageously is to distribute circulars among employees, listing all possible sources of waste, then show how each waste occurs and suggests how it may be reduced. In this way the matter is brought very forcibly to the attention of all concerned.

If the question of waste reduction is enlarged to include not only material wasted, but time and effort that is not 100% productive, a worth-while reduction in manufacturing costs may result.

A nail driven across the grain holds tighter than one driven with the grain.

J. Walter, Sr., Passes

The sudden death of J. Walter, Sr., president of J. Walter & Sons, Limited, Kitchener, Ont., which occurred recently, came as a shock to his many friends and business acquaintances in the furniture and allied fields. Previous to his demise, he was enjoying the best of health and being stricken suddenly, passed away inside of twenty-four hours.

The late Mr. Walter was well and favorably known to furniture manufacturers in connection with the development of wood fibre ornaments for furniture; in fact he was the originator of this form of ornamentation. His earlier education was received, while still a very young man, in the art schools of Germany and France. After emigrating to this continent, he worked for many years as a sculptor. The federal buildings of Detroit, the various churches and other buildings in different parts of the United States bear evidences of his skill along this line.

J. Walter, Sr., Kitchener, Ont.

The idea of making furniture trimmings was first conceived in Detroit some 20 years ago. After spending a great deal of money, time and effort the process was perfected and now fibre ornaments are an every-day commodity and are found in all grades and classes of furniture.

Many Canadian furniture manufacturers will remember Mr. Walter as being the first man to imitate the wood grain by casting a plaster paris composition into rubber moulds. As far as grain imitation is concerned, this method has never been surpassed, but the durability of the resulting ornament was wanting. However, both methods and materials have been improved and developed and the wood fibre carvings of to-day are the practical culmination of his earlier visions.

Of late years he confined his activities to designing and originating ornamentation that will in all probability be looked up to for years to come. Last summer he spent some six months in Europe assimulating new ideas in ornamentation. Since his return he has designed many new and original ornaments but, unfortunately, did not live to see them introduced to the trade.

It might not be amiss to mention that while his death was rather sudden, being seriously ill hardly twenty-four hours, it was his own prediction that his passing away would be brief and unexpected. For this reason his last two years have been spent largely in so organizing his business that it would be successfully carried on after his demise. The business he organized has developed to such an extent that it is entering the export field. Orders have been secured in the following countries:—England, Scotland, Ireland, Holland, Belgium, France, Spain, South America, South Africa and Ceylon.

The Late George Lippert, Sr.

Elsewhere in this issue will be found a reference to the passing of J. Walter, Sr. In the death of George Lippert, Sr., Kitchener loses another prominent and progressive citizen. The late Mr. Lippert was president of the Lippert Furniture Co., Limited, Kitchener, Ont., and for the past 17 years had been a member of the Kitchener Life Commission, of which he was chairman for many years. It is, probably, as a successful furniture manufacturer that he is most widely known, being one of the oldest manufacturers in this field.

The deceased served his apprenticeship at the old Simpson factory in Kitchener. Being ambitious and industrious he wanted to see how business was conducted in other plants, and for a number of years was an employee of the H. Krug Furniture Co., Limited. He was a first-class cabinet maker and machine hand and as he gained in experience, he yearned for a business of his own. In 1893 he entered into partnership with the late Henry Schaefer, and started manufacturing in Waterloo in what is now known as the Woeller-Bolduc factory. For over five years this firm carried on successfully and then Mr. Lippert decided to branch out for himself. A factory was erected on Louisa St., Kitchener, in 1899. As the business increased, additions were made to the plant from time to time. Strict attention to business usually means success, and the present commodious factory is a monument to the late Mr. Lippert who saw great things in store for his growing industry

Permanent Mahogany Association

The Mahogany Association which was formed in New York some six months ago to conduct an extensive publicity campaign in favor of this wood was, at a meeting held in New York on March 2nd and 3rd, turned into a permanent organization. Among the officials of this newly-formed Association are T. R. Williams, F. B. Sawyer, H. Freiberg, F. G. Otis, C. C. Mengel, Jr., and Douglas H. Allen. The members of this organization comprise virtually all the importers and manufacturers of mahogany in the United States.

Two More Firms Settle with Perkins Glue Co.

It is reported that the Breece Manufacturing Company of Portsmouth, Ohio, and the Globe-Wernicke Company of Cincinnati, Ohio, have settled with the Perkins Glue Company for their infringement of Perkins Glue Company's Vegetable Glue Patent. It is understood that the amount paid was very substantial in both cases.

Information and Inquiries

You are cordially invited to make use of this department

How to Kiln Dry B. C. Fir

London, Ont.
February 17th, 1922.

Editor, "Canadian Woodworker,"

Will you kindly publish some information dealing with the kiln-drying of B. C. fir? We have experienced some difficulty in drying this wood, chiefly from checking, and think that other readers would appreciate the same information.

Sincerely yours,
Dyment-Baker Lumber Co.

The following information submitted by J. O. Cameron, president, Cameron Lumber Co., Victoria, B. C., covers the kiln-drying of B. C. fir in a practical manner:

"We find in practice that we can make a better job of kiln-drying the fir green from the saw than to undertake to dry it after it has become partially air dried.

"Many systems have been used in kiln-drying fir, most of which if carefully watched and carried through in an intelligent manner will produce good results. The latest development is that of using first live steam to get the lumber thoroughly heated through and through, the grain all soft and tough, and then using a draft of hot air which is passed through the kiln and the lumber is quickly dried to the required degree of moisture content. We use two types of kilns, one is what is known as the "Oldfield" type, which is a quick drying kiln. This kiln does not work very satisfactorily on any except one inch lumber, which can be dried successfully in from twenty-two to twenty-four hours.

"The kiln is charged with lumber and closed up tight, live steam is then turned in until the lumber has become thoroughly heated through and saturated. This last in case the lumber is not thoroughly green at the time it is put in the kiln, but if green lumber from the saw is put in it is not necessary to put the live steam in the kiln. The temperature in that case is raised to about 280 degrees to 300 degrees, which is above the boiling point and all moisture in the lumber converted into vapor, there is then a system of vents which are opened and allows this vapor which has been steamed out of the lumber to escape into the air. The lumber is then allowed to remain in the kiln with the vents open until it has had an opportunity to drop down to a reasonable temperature, say 100 degrees or less when the kiln is opened and the lumber removed. The point being that it would not do to open the kilns and expose the dry lumber to the cold atmosphere when it had been at a temperature as stated of 250 to 300 degrees.

"The other type of kiln we use is known as the "North Coast Dry Kiln." For the purpose of allowing you to see how that is handled, I am quoting the words of our planer superintendent, Mr. Axel Bulow. You will see from his statement just what he considers to be the proper method of handling this kiln:—

"The kiln most extensively used on the Pacific Coast is of the progressive type, that is, as a dry car is discharged a green one put in, but as it is not satisfactory, we charge one whole kiln with green lumber of as near the same size as possible. When using an ordinary kiln that way a steam pipe must be provided running the whole length of the kiln, and with perforations on top side for controlling the humidity.

'Small sizes, say up to 1" x 6" can be dried in forty-eight to sixty hours, depending on circulation and temperature.

'Starting with 100 degrees Fahrenheit and 100 percent relative humidity and gradually increasing the temperature so in twelve hours it would be about 160 degrees and 50% relative humidity, and in forty-eight hours, 190 degrees and 15% relative humidity. Providing the circulation is good, the lumber will then contain about 10% moisture which is considered dry for ordinary use.

'Lumber 1" thick and wider than 6" can be successfully dried in eighty hours, starting the same way as on the narrower stock with gradual increase in temperature and decrease in humidity, so as to finish at 175 degrees and 30% relative humidity. Two inch stock requires an additional ten hours with somewhat lower temperature.

'When temperature, humidity and circulation are properly controlled, we experience very little difficulty in drying fir and have only a small percentage of degrade, in fact, much less than in air drying.'

"I hope that our statements here may prove of some benefit to your Eastern readers. There is no trouble about the kiln drying fir lumber successfully if it is handled in a proper manner, and I believe that I may state that any system of handling other woods, such as, oak, maple, Southern pine, if followed as with fir will produce as good results. In other words I do not consider that fir is any more subject to checking, warping and otherwise becoming injured by kiln drying than other classes of wood."

Brass Cups for Candle Sticks

60 High St.,
St. John, N. B., March 25th, 1922

Editor, "Canadian Woodworker."

Would you please inform me as to where I can purchase some ferrules or cups for the top of wooden candlesticks. Would prefer to secure these in Canada, if possible.

Sincerely Yours
John O. Baxter

It is more than probable that you can secure these candle-holders from Larsen & Shaw, Limited, Walkerton, Ont., or from the Hahn Brass Co., New Hamburg, Ont.

Market for Short Cedar Pickets

Warren, Ont.,
March 20th., 1922

Editor, "Canadian Woodworker."

Would you kindly give me any information you have in regard to the market for cedar pickets? I have a lot of 4-foot cedar logs and thought I might saw them into pickets, if a market exists.

Sincerely yours
D. I. Warren

At the present time there is very little demand for pickets of this kind, not enough to warrant you engaging in their manufacture. Would suggest that

you look around and see if you cannot decide on something which is in much stronger demand. You might be able to turn your cedar logs into shingles. There is also a possibility that you could work them into crating lumber for crating furniture and other articles. They might also be turned into certain kinds of boxes. Another suggestion is that you might run this material into V or beaded sheathing and bundle it and sell it as wainscotting.

Woodworking in N. B.

Newcastle, N. B.
April 7th, 1922.

Editor, "Canadian Woodworker,"

If possible, I would like you to give us any information you can on the subject of woodworking, that is to say, what articles can be successfully manufactured in New Brunswick from native woods? Would excelsior or wood wool, made from poplar, be practicable in your estimation?

Kindly let me hear from you.

Sincerely yours,
H. C. Rundle.

It is practically out of the question for us to make suggestions along this line as we are not in a position to study the requirements of your local market. As far as excelsior is concerned, it is quite practicable to make this wood from poplar, in fact this wood is preferred by most excelsior manufacturers. Whether or not it would pay you to engage in the production of this material, depends entirely on the demand which exists in the Maritime Provinces, as it is doubtful if you could successfully enter the Quebec or Ontario markets. Have you considered the idea of a small general woodworking plant catering to the demand for special woodwork of various kinds and perhaps manufacturing some simple articles for which you could find a ready sale?

Definition of Term "Superficial"

Truro, N. S.,
April 4th, 1922

Editor, "Canadian Woodworker."

I would be pleased if you will explain the meaning of the word" superficial" when applied to lumber. I have often seen this word when ordering this material, such as "500 superficial feet of sheathing." Does it mean surface measure or board feet?

Sincerely yours
W. H. Faltenhine

"Superficial" is another term for "square feet". When applied to flooring, such as "50 superficial feet of flooring," it would call for sufficient material to cover 50 superficial square feet. It thus differs from strip measure as used for flooring, sheathing, etc., where 1000 feet strip measure might only cover 800 square or superficial feet of surface depending on the width allowance.

What would you say was the percentage of serviceable wood in an ordinary tree?

When you cannot afford a pneumatic system to remove your chips, and dust, sack them up as often as possible, as this will reduce fire risks.

Special Furniture Week at Windsor

A "Furniture Fashion Week" is scheduled for Windsor, Ont., during the week of April 24th-29th. This is being held under the auspices of the Home Furnishings Bureau working in close co-operation with the retail furniture dealers of the Border City. The furniture retailers are taking an active interest in this event and are leaving no stone unturned to make it an outstanding success. Special displays of attractive furniture are being arranged in the various stores, showing desirable room arrangements. Various public and educational bodies have entered into the spirit of the scheme and are supporting he movement by every means in their power.

The "Furniture Fashion Week" is being advertised extensively all this month, and during the period the show in on, a large volume of high-class copy will be carried in local papers. It is expected that the dealers working with the Home Furnishings Bureau, will carry an attractive two-page spread for the entire week.

If suitable arrangements can be completed in time, a series of lectures will be given on various phases of home decoration. Such subjects as color schemes, arrangement of furniture, furniture styles, how the home can be made more attractive, etc., will be covered. This is in line with the lectures being given in various American centres by Ross Crane of the Art Institute of Chicago.

While it is expected that a considerable volume of furniture will be sold during this show, yet the main objects behind the scheme are to arouse a greater interest in the home and to create a desire for better home furnishings, better furniture and more attractive home surroundings; in other words, to make "better furnished homes" a reality and thus create an enlarged and permanent interest in better furniture.

Conveyor Belts for Waste Removal

There seems to be a tendency among the more progressive woodworkers to instal a belt conveyor system under the machine floors to carry all waste edgings, trimmer blocks, etc. At regular intervals in the floor, openings are made which lead directly to these conveyor belts. It is a very easy matter to raise the cover and shove the edgings through the opening. In the case of some machines, such as the swing cut-off saw, the opening can be placed under the table and left open at all times. When this is done, the swing cut-off saw-man drops the waste pieces through the hole as they are made so that they are carried away without any additional handling.

A system of this kind not only does away with unproductive labor in the removal of this waste, but the productive work men are not interfered with by the trucking away of this material.

U. S. Piano Production

According to well informed authorities, there were approximately 175,000 pianos made last year in the United States, although some estimates are below that figure. Ten years ago there were 350,000 pianos made and shipped and in 1919, according to the census report there were 336,000 manufactured. In view of the heavy increase in population, the reduced output of pianos is difficult to explain.

Upholstring and Trimming

How Winged Chair is Developed

Treatment of Arms and Wings—Special Care Required to Keep Stuffing on Arms and Wings Same Depth

The next step in the upholstering of the chair described in the March "Canadian Woodworker, is the building up of the arms and wings. The arms require considerable shaping-up, and for this reason it is best to double-stuff them, keeping the stuffing soft and giving the edge a single stitch to create the foundation shape, as illustrated in Fig. 92.

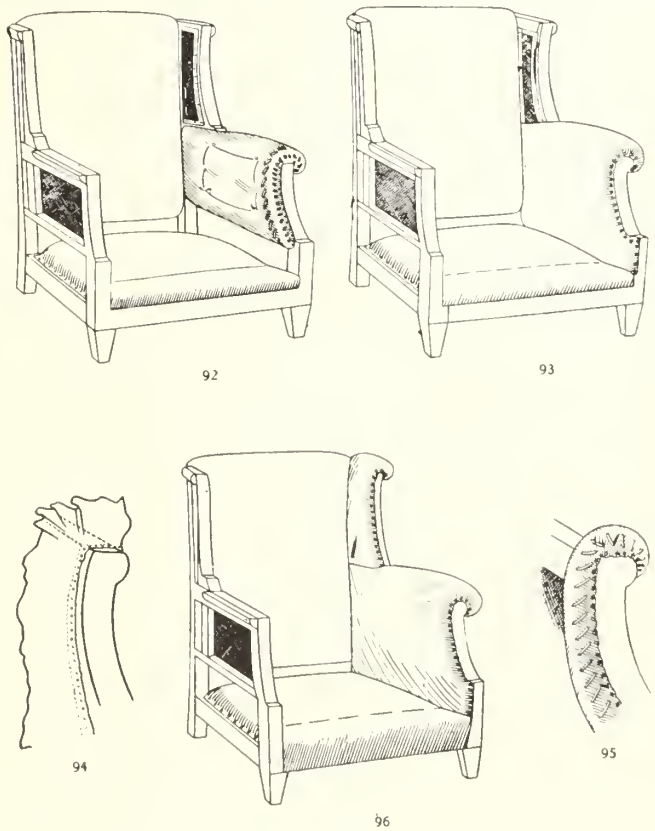
It is well to continue the upholstering of the arms up to the muslin stage before treating the wings, because the wings must be built out to the same thickness as the upholstering of the arms, so that the join, where the two meet, as shown at XX in Fig. 97, must be absolutely smooth so that the covering may be continuous with the seam at this point.

The arm, as it appears in the muslin stage, is illustrated in Fig. 93. It may be possible to double-stuff the wings, but a stitched nosing answers for all practical purposes. The canvas for the nosing is back-tacked on the front of the wing, as shown in Fig. 94, allowing sufficient fullness for the corners, so that it may -be stuffed up and stitched to form the sym metrical roll illustrated in Fig. 95. This section is then lightly covered with hair and shaped up in muslin, as shown in Fig. 97.

The join between the wings and arm is blind-stitched in the muslin so to make a smooth continuous surface. When completely covered in the muslin, this chair has the appearance shown in Fig. 97, and is then ready for covering.

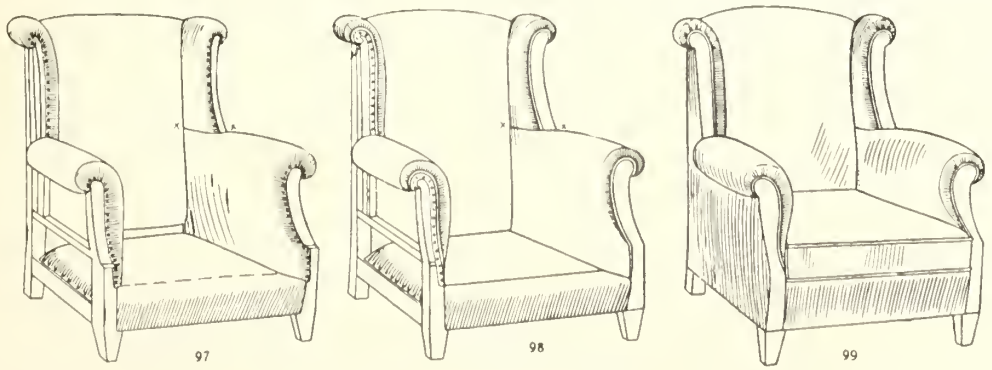
We need not here go into details with regard to the covering of this piece, because in all respects, the handling of the covering is the same as we have described for other wing chairs, the coverings for the arms and wings are fitted into position and pinned together so that the seam at XX Fig. 98, may be machine-sewn and pressed, presenting a smoothly finished appearance.

The chair in the completed illustration, Fig. 99, shows a welt surrounding the panels on the front of the arms and wings. This welt may be provided in either of two ways; it may be tacked to the face of the arms and wings, as shown on the left side of Fig. 98, or it may be tacked to the back of the wooden panels and finished on the front of the arms and wings. These wooden panels are covered and the covering carried around underneath the outside lin-



Double—Stuff Arms Before Treating Wings

Please Turn to Page 82



Wood Panel on Face of Arms and Wings not Essential Though Often Used

ings after the panels have been tacked into position.

It is possible to do without these panels, but the chair we have illustrated is provided with them and therefore we have carried through the explanation of their use.

Packing Should Receive More Attention

Dealer put to Considerable Annoyance and Loss Because of Poorly Packed Furniture—Retailer Would Gladly Pay Slightly More for Better Packing

By A. W. LUHRS

The question of the proper packing of furniture for transportation has long been a source of annoyance and study for the furniture shipper. Under present conditions of keen competition many manufacturers believe it a positive necessity for them to pack and route their goods in such a way as to insure as little damage as possible, feeling that satisfied customers are valuable assets to their business. However, the fact that all shippers do not feel the same is generally known and is evidenced by the views of one shipper who says: "the railroads are charging me 10 times as much to haul my freight as they are to haul pig iron. I don't believe in packing my goods well for if they are damaged, the roads, because of the high rates, can afford to pay, and I'll send the retailer another shipment, in that way saving the cost of better packing and the freight on it."

The consignor, whose goods are often damaged due to improper packing, even though he thinks he is saving money on his packing, forgets that he is losing in another way more than he is saving. For example, the annoyance and costs of filing claims for the consignee, or of furnishing data to the consignee where he files the claim, amounts to a very considerable item. The loss of business due to poor packing is frequently great and in this connection I have found that many retailers buy goods from one manufacturer rather than from another because of the good condition in which the first shippers' product arrives, even though his price is somewhat higher.

Effect on Freight Rates

Freight rates are usually based, among other things, on the handling of a commodity and its liability to damage, which is especially so now under the Transportation Act. This Act allows the carriers to earn but a certain percentage, after which rates must be lowered, and as damage claims paid are of course deducted from earnings, the greater the claims, the less is the possibility of a reduction in rates on that commodity. It is only reasonable to suppose that the entire furniture trade is paying high freight rates at the present time, partially due to the fact that the claims, because of the poor packing of some members of the trade, are exceptionally high. It appears logical to suppose that with a reduction in claims there should be a corresponding reduction in rates.

Because of the differences of opinion existing between some shippers, the railroads, and the members of the Trade Associations, it appears that the time has come for a complete study of the subject from all angles. It is expected that the question of the packing of furniture for rail transportation will be settled on its merits, so that on this important subject there may be harmony between the members of the Trade Associations and between the Associations and carriers.

Comparative Cost of Packing

In the New England states the cost of good crating material and labor is comparatively high and a good crate for a bureau or for 6 chairs costs complete about $1.25. For that reason manufacturers believe that for case goods costing under $15.00 each, a packing costing but approximately 50 cents, burlap and excelsior, is what should be used both for carload and less carload shipments, while higher priced articles should be well crated. It is obviously impossible to ship the mirror along with the bureau when it is packed in burlap, so where one consignee is to receive several bureaus the mirrors are packed together and crated in another crate, while when the piece is crated the mirror is sent along with the furniture. In the one case the total cost of the complete shipment is not over $1.25, while in the other the burlaping costs 50 cents and for an average of 4 mirrors in a crate an additional 25 cents per mirror, making a total of 75 cents for the complete bureau. This shipper figures that he has saved 50 cents per bureau on the packing and in addition the freight charges on the lumber of the crate. What does his customers say? I called on the buyer of one of the largest retail stores in a large eastern city who told me that he no longer buys his goods from this same shipper, who packs his shipments in burlap, be-

(Please turn to page 80)

Eagle-Ottawa Leather Co.

TANNERS OF

FURNITURE LEATHER

OF EVERY DESCRIPTION

We are making a specialty of cutting

Spanish Split Leather for Chair Manufacturers

Quotations and samples furnished on application

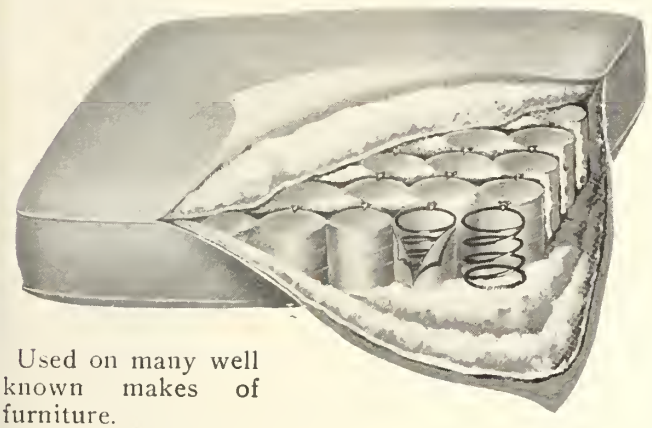
We will be pleased to supply a very attractive sample book, of all our grades on application.

GRAND HAVEN - - - - - MICHIGAN

"COMFY" CUSHION COMPANY
Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.

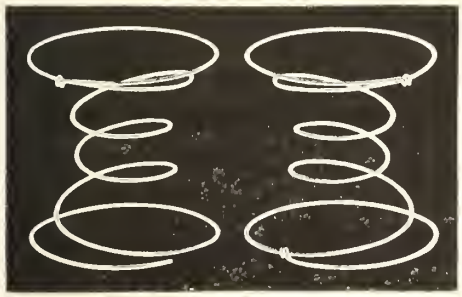


Used on many well known makes of furniture.

Write for Catalogue

"Comfy" Cushion Co.
340 Gerrard Street, East, TORONTO, Can.

"IDEAL"
FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,
of Canada, Limited
Windsor - Ontario

The
ORIENTAL TEXTILES COMPANY
LIMITED
Oshawa, Ontario

Manufacturers of
Upholstery
Mohair
and Velours

Agent
J. H. ALLEN
33 MELINDA STREET
TORONTO

Twines and Cordage

"Doon" Twines are known throughout the woodworking industry for their absolute dependability and uniform quality. They are entirely "made in Canada."

Spring Twines, Stitching Twines, Seaming Twines, Tufting Twines, Wrapping Twines, Flax, Hemp and Jute Twines for all purposes.

Write for samples and prices.

DOON TWINES, LTD.

Mills at Doon and Kitchener

Head Office: Kitchener

MARIETTA ENAMELS

MARIETTA WOOD AND METAL FINISH SPECIALISTS

Here's what one of the largest furniture manufacturers says:

> We have tried many enamels and undercoats, but have finally settled down on "Marietta," which we find are head and shoulders above any of the rest.

We make enamels for every purpose, from finishing low-priced toys to enameling the finest bedroom furniture.

> We have or can make the exact enamel you need.

ALL COLORS.

The Marietta Paint and Color Co.

Marietta, Ohio

D&P

QUALITY

CURLED HAIR GLUE SANDPAPER

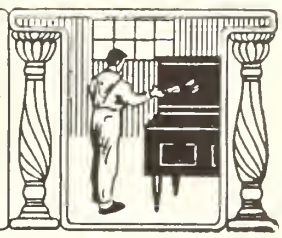
DELANY & PETTIT LIMITED

TORONTO.

OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC

THE FINISHING ROOM



Spraying for Speed and Satisfaction

Perfected to Meet Demands of Time Schedules—Important Factor in Finishing Work—Mechanical Devices Lessen Labor—All Finishing Materials Handled to Good Advantage

The old Italian craftsman, working beneath the shade of the Umbrian hills, applied his finishes to the cabinet he had made, or to the table, chair, or other master production, slowly and patiently by hand. Why should he not, time being no element of importance? This table he was making for the Duke, or that chair he was making for the Cardinal, or yonder cabinet he was finishing for some merchant prince—these were the total of his production for many weeks, perhaps month. There was not overly much good furniture to make, only the grand and the powerful could afford these masterpieces. Time was but a trifling account.

The young workman in the busy finishing department of the modern furniture factory, working beside the busy hum of large factory production and the speed of today, applies his finishes with apparatus that has been perfected to meet the demands of time schedules in the busy modern days. Time is an element of commanding importance—in many ways, it is the element of utmost importance. But at the same time, hurry and speed must not sacrifice perfection. It is of equal importance that the buffet or the table or the dresser that is to find its way into some American home must have the same pleasing and durable finish as the Duke's table, the Cardinal's chair or the merchant prince's cabinet.

Era of Productiveness

Then, too, today the finishing department is called upon to make pleasing in appearance and durable in use many thousand times the number of pieces that were made in a whole land in the older days. For better, for worse, we are living in the age of machinery production. Skill of hand is no less, perhaps it is more than formerly. Art still holds its place but is allied with modern methods and means.

A trip into the finishing room of any great furniture factory will demonstrate the wonderful skill and the exact perfection of modern methods of spraying finishes by air. In several of the larger factories visited on a recent trip, one was impressed with the results won by the finishing departments that were equipped with spray finishing equipment. Here, for instance, was a factory making reed and wicker articles, articles that demand a great deal of skill to finish and which under the operation of hand work would eat up time by the decade and increase production costs by the hundreds of dollars. Today there is a great demand for reed and wicker, and without equipment like spraying devices, manufacturers of such furniture would be unable to meet the demands. Manufacturers on every hand, who specialize in the production of reed and willow furniture bear testimony to the worth of such devices, and maintain that not only do such machines increase production but are far superior to hand work.

Aids to Handling Articles

One of the outstanding features of such a system is its ease of operation. The devices are so designed that the articles may be handled very quickly and easily by the operator. The heavier or more cumbersome pieces of furniture can be raised, lowered and turned at the desire of the operator by a cleverly constructed pneumatic lift turntable which is made in two sizes. These devices are most convenient, as they eliminate unnecessary handling, the work can be done very quickly.

Wood fillers can be applied with the air brush from overhead containers. If designed, agitators can also be attached to these containers which keep the material in suspension.

Shellac may also be used with the same air brush, from another container.

Varnishes can be drawn directly from the original drum or barrel and applied smoothly and evenly.

The equipment for this class of work, while essentially the same as the larger outfits, differs only in the size of the cabinets. The accessories used in connection therewith are identical. Six-foot cabinet installations are the most popular as they will also accommodate benches as well as chairs. Divans, longer tables and benches should be finished in the eight-foot cabinets. The forty-inch regular style turntable is recommended for use with these articles.

All furniture finishing equipments should provide for the varnish to be used directly from the original container, if production warrants its being used in large quantities. Whenever enamels are used the pressure feed tanks in capacities of four, eight and twenty gallons should be employed.

Specially Effective on Chair Work

It has been conclusively demonstrated that all chair factories, irrespective of their production, or the extent thereof, should use these equipments. It reduces their costs, makes them independent of exorbitant demands of unreasonable laborers, and renders it possible to manufacture their products at a larger margin of profit than those factories employing the hand brush methods.

The efficiency of the equipment is everywhere evidenced by results. Good work, done well and quickly at the greatest saving of time and the least waste of materials, is a "consummation devoutly to be wished." Here is this gigantic factory the air devices were doing that very thing.

In the finishing of phonopraph cabinets, under conditions that demanded not only speed, but low cost of production and good work, the air device won its laurels in the finishing rooms of hundreds of factories all around the country. Twin installations where two machines used a single exhaust unit were

great favorites. Two men worked these, one placing the cabinet in its proper position and the other doing the spraying, a combination that worked for great speed in the work.

Specially devised equipment for the finishing of toys, juvenile furniture and novelties have come into general use. One of the most popular of these is that which provides working space for three operators. This is for particular work on small pieces, and larger equipment is necessary for larger pieces. Picture and mirror frames, machinery and castings, pianos, automobiles and leather novelties, all these and a myriad of other things are now given their finish by equipment such as we have been describing.

Efficiency of Exhaust Important

The air brush and exhaust are the two most important units for industrial finishing equipments, according to many finishing room experts. In the efficiency of the exhaust system depends the disposition of the operators performing the work, and the safety of workmen in the immediate vicinity of the cabinets. The fumes and odors can only be carried off and out of the cabinet and finishing room by an exhaust of sufficient power and size.

An erroneous impression prevails in some quarters that an exhaust fan used for discharging hot air from a shop will properly function for carrying out fumes from varnishes, paints and enamels. This is untrue. The exhaust must be especially designed and constructed for this purpose.

The object of the finishing cabinet and exhaust units is to eliminate all fumes and odors which result from the atomization of liquid finishing materials at high pressure. It is therefore very easily observed that one of the most important devices to the efficiency of this equipment is its exhaust system.—Furniture Index.

Good Varnish—How to Test It

Outline of Tests and Specifications for Varnish for Interior Work—Qualities to Look For in Varnish—How Tests may be Made to Determine Desirable Properties

(concluded from March issue)

The first part of this article, published in the March issue, gave an outline of the qualities which should be found in good varnish and how tests for appearance, color, flash point, non-volatile matter and drying time may be made. Tests for other desirable properties are described in the following paragraphs:

(f) Toughness.—Thoroughly clean with bensol a sheet of bright tin 7.5 by 13 cm (about 3 by 5 inches). Flow the varnish on one side of the tin plate and set in a vertical position in a well-ventilated room, not in the direct rays of the sun, at a temperature not below 21 deg. C (70 deg. F.)

After the varnish on the tin plate has dried for 48 hours bring to a temperature between 21 and 24 deg. C (70 to 75 deg. F.), and with the varnish film on the outside, bend rapidly over a rod 3 mm (1/8 inch) in diameter. The film must show no evidence of cracking or flaking.

(g) Water Resistance.—Prepare a panel as in (f) and let it dry in a well-ventilated room for 48 hours. Place the panel in a beaker containing about 2.5 inches of distilled water at room temperature (immersing the end of the panel which was uppermost during the drying period) and leave in water for 18 hours. The varnish shall show no whitening and no more than a very slight dulling when observed after removing the panel from the water and drying for 2 hours.

(h) Flowing and Rubbing Properties.—Thoroughly clean with benzol a glass plate about 15 by 20 cm (6 by 8 inches). Flow the varnish so as to entirely cover one side of the plate and stand in a nearly verticle position with the long edge horizontal for 8 minutes. Then draw lightly a 25 mm (1 inch) section of a hard-rubber comb (having 8 to 10 teeth to the centimeter) horizontally across the varnish surface, first 2 cm from the bottom and then 2 cm from the top of the plate. Let panel stand in the same position for 20 minutes longer then lay flat. An exaggerated condition of a dusty room shall be created by rubbing some cotton batting between the hands immediately over the panel. Let panel dry for a total of 48 hours in a well ventilated room. If the comb marks show at this time, the varnish shall be rejected. If no comb marks show, the surface shall then be rubbed with pumice flour, water and a felt pad with long, even, firm strokes back and forth in one or another direction, but not in circles, until every portion of the panel has been rubbed. Most of the pumice will then be removed from the pad and panel, and the varnish film given a "water rub" with the pad.

A satisfactory rubbing varnish in the above test will yield a smooth, dull film, even at those places where the dust particles have been encrusted in the film, and shall show no spots where the pumice has been ground into and become attached to the film, nor show any other evidence of gumming. No sweating shall occur anywhere on the film in 18 hours after rubbing.

(i) Gas Test.—Apparatus.—The necessary apparatus consists of a glass bell jar approximately 20 cm (8 inches) in diameter and 30 cm (12 inches) in height, inside dimensions, having a ground-glass rim; a ground-glass base plate of suitable size; a small, kerosene glowlamp without chimney, or a small alcohol lamp filled with kerosene, using a round wick not over 6 mm (¼inch) in diameter and adjusted to give a flame 2 cm (4/5 inch) in height. A wire or a light wooden frame is fitted inside the jar and provided with a support for holding a disc of tin plate 15 cm (6 inches) in diameter in a horizontal position 5 cm (2 inches above the wick of the lamp.) The frame must also be provided with several other supports above this disc for holding in a horizontal position the various varnished panels under test. The test panels consist of semicircular pieces of bright tin plate approximately 15 cm (6 inches) in diameter.

The form and arrangement of the above apparatus is designed to provide an even distribution of the products of combustion over the test panels.

Method.—First determine the normal time required for the varnish under examination to set to touch

at room temperature. Divide this time by five to arrive at the different drying periods at which the varnish is to be tested in the gas tester. Thus, if a varnish sets to touch in five hours samples should be tested for resistance to gas at drying periods of one, two, three, and four hours; it is needless to use the fifth or five-hour period for the above varnish which has set to touch is practically immune to injury from gas fumes. Similarly a varnish which sets to touch in one hour should be tested for resistance to gas at drying periods of 12, 24, 36 and 48 minutes.

Example.—A varnish which sets to touch in five hours is tested as follows:

First, clean two of the semicircular, bright, tinplate panels carefully with benzol. Flow the varnish on one-half of panel No. 1 at, say, 10 a.m., and allow to drain in a nearly vertical position at room temperature. At 11 a.m., flow the varnish on the other half of panel No. 1; allow to drain as before. At 12 a.m. varnish one-half of panel No. 2, and at 1 p.m. varnish the other half as above. At 2 p.m. place the two panels close together in a horizontal position on the upper supports of the frame. Light the lamp and set it under the circular tin. Place the bell jar in position, centering it as nearly as possible, properly seated on the ground-glass plate. If the chamber is tight and lamp properly adjusted, the flame will be extinguished in about four minutes. After the panels have been in the chamber for half an hour, remove the bell jar and examine the varnished panels for gas effects.

The varnish on all four sections should remain bright and clear without trace of pitting, "crow's footing," frosting, or other defects.

Attractive Brown Shade for Oak

by C. H. G.

Furniture styles change pretty much as the styles in hats and dresses, though the changes are not quite so frequent or so radical. They do change from time to time though, and in changing, alter the popular demand for different kinds of wood.

Those who recall the days when black walnut was occupying the centre of the stage in woodworking, remember also that walnut went out as oak came in as the chief material for the manufacture of furniture. They will also remember that the thing which seemed to please the public most about oak was the marked figure obtained by quartering at that time, and for some years later, quartered oak with a splashy figure, the larger the better, had the preference. People who had been using walnut, which was dark and with comparatively little figure, seemed to be pleased at the opportunity of getting furniture which "talked," and which, while not exactly loud, could properly be described as extreme. Then mahogany began to have a big run.

During the past few years, however, it has been apparent that the pendulum is swinging in other directions both as to figure and wood. Walnut with its small figure and its quiet aristocratic appearance is again taking the lead as material for the furniture work. It is light because of its brown wood, and browns are once more in fashion, and because it has a good appearance without too much figure.

Furniture manufacturers who have a large stock of oak on their hands and especially plain oak, have deemed it advisable to manufacture oak furniture with little or no figure in a beautiful brown color. This brown oak will eventually be the greatest in demand. There are several methods used in producing this color, but for a rich transparent color, a water stain is the superior. After the stain is thoroughly dry, the wood should be sand papered, smooth and filled with a walnut filler. After the filler is dry, it should be coated with waterproof lacquer. When dry, sanded and given another coat and then sandpapered and waxed with the best old English wax.

Cutting Down Finishing Costs

A reduction in finishing costs can be made by giving greater attention to the preparation of the surface in the factory proper. The smoother and more uniform the surface to be finished, the less work and the less material will be required in the finishing department. This is true to such an extent that some furniture manufacturers have been able to reduce the number of coats of varnish from four to two and produce a better finish. Not only is there a saving in material and in its application, but there is less rubbing to do as the varnish flows evenly and lies flat on a smooth surface, whereas if there had been slight imperfections, additional labor would have been required in the rubbing department to overcome such inequalities. It is not fair to the finishers to expect them to overcome indifferent work on the part of the woodworking department, and any extra expense which might be incurred in an effort to improve the woodworking operations would be more than offset by the saving which would result in the finishing department.

Shellac a Scarce Product

At the present moment there is a shortage of shellac and as a consequence the price has soared. In the opinion of many importers prices will remain where they are until well into the summer months. The advance in shellac values were such that many importers felt that the market would not be sustained, with the result that they did not buy, as usual. This partially accounts for the shortage at present experienced. In addition to the scarcity of this product general conditions of unrest in India must also be taken into consideration. The question of transportation is a vital one as railroad strikes are interfering with the transportation of up-country stocks, and sailings are being postponed on account of non arrival of shipments. Taking it all in all, it looks as if present conditions will last for a number of months.

Warning

Subscribers and other are warned against giving subscriptions or paying money to two men by the names of Garin and Barnes. These men have recently been operating in the Maritime Provinces. One Garin was authorized to take subscriptions for Hugh C. MacLean Publications, but his methods were found unsatisfactory and he was discharged. Barnes was never given authority. Certain forms bearing the name Hugh C. MacLean, Limited, and used to facilitate them in obtaining money, were printed by them without our knowledge or consent.

Packing Should Receive More Attention

(Continued from page 74)

cause of the condition in which they arrive. They are frequently damaged slightly by the carrier and then have to be worked over. Even when not damaged by the carrier, in warm weather the top surface is printed from the weight of the piece packed on top of it, causing considerable annoyance and expense to the dealer, for which he is not reimbursed by the Railroad. He told me that it is cheaper for him in the end to buy crated goods than shipments packed in burlap. In addition to the condition in which they arrive, the air in the warehouse, in which most dealers store their goods, can circulate around the furniture, if it is crated, while if packed in burlap that is impossible.

Must Withstand Rough Handling

There is no question but that freight is frequently very roughly handled by the carrier, yet, as it is known that there are certain unavoidable shocks which shipments will get, such as coupling of freight cars, switching cars over a hump, taking out the slack in a freight train when starting, occasional transferring at freight platforms, etc., it appears that goods should be packed in a way to at least withstand such unavoidable impacts. It is thought that if all the shippers were required to crate shipments costing over a certain unit price, the cost of crating would be included with the cost of the article and all shippers would then be on an equal basis, and in addition be relieved of much annoyance in connection with damaged shipments.

Other shippers say that if the retailers wanted

(Please turn to page 96)

E. T. CARTER & CO.

84 FRONT STREET EAST
TORONTO

Dealers in

Fibro Products, Linters, Reeds, Rattans, Waste.

Quality Guaranteed. Prompt Shipment

"ENAMELS"

Our business in both White and Old Ivory Enamels and Primers has trebled during the past year.

WHY?

They are the best on the market. If you are not using them, write for samples and prices.

The **Ault & Wiborg Co. of Canada, Ltd.**
Varnish Works
Montreal Toronto Winnipeg

FLINT

Flint Products for Artistic Furniture Finishing

The BLUE DIAMOND finishing materials appeal to the manufacturer of high grade furniture because they combine equisite appearance and ability to withstand hard usage.

There are BLUE DIAMOND products which will solve your finishing problems.

We shall consider it a pleasure to send our service man to demonstrate any of our broad line of finishing materials, or to render any service within our power. This places you under no obligation to us.

Pyroxylin Lacquers for Wood or Metal.
Pyralin Enamels.
Bronzing Liquids.
Bridgeport Stains.
Wheeler's Wood Fillers.
Flintsatin Cabinet Finish.
Rubbing and Polishing Varnishes.
Furniture Enamels.

Flint Varnish & Color Works of Canada, Limited
Perth and Kingsley Aves., West Toronto

Owned and operated by
CANADIAN EXPLOSIVES LIMITED

Why Waste Money in Your Drying Room?

Air-drying of coatings of any kind is out of the question. No manufacturer could afford it even if the best drying conditions always prevailed—which they do not.

But with Nichols Varnish Drying Equipment you always have very much better than the best natural conditions, reducing days of drying to hours, and the drying is better done: "From the inside out."

This is accomplished by producing always and automatically the correct combination of temperature and moisture, and of air that is absolutely clean.

Why is a Spray Head?

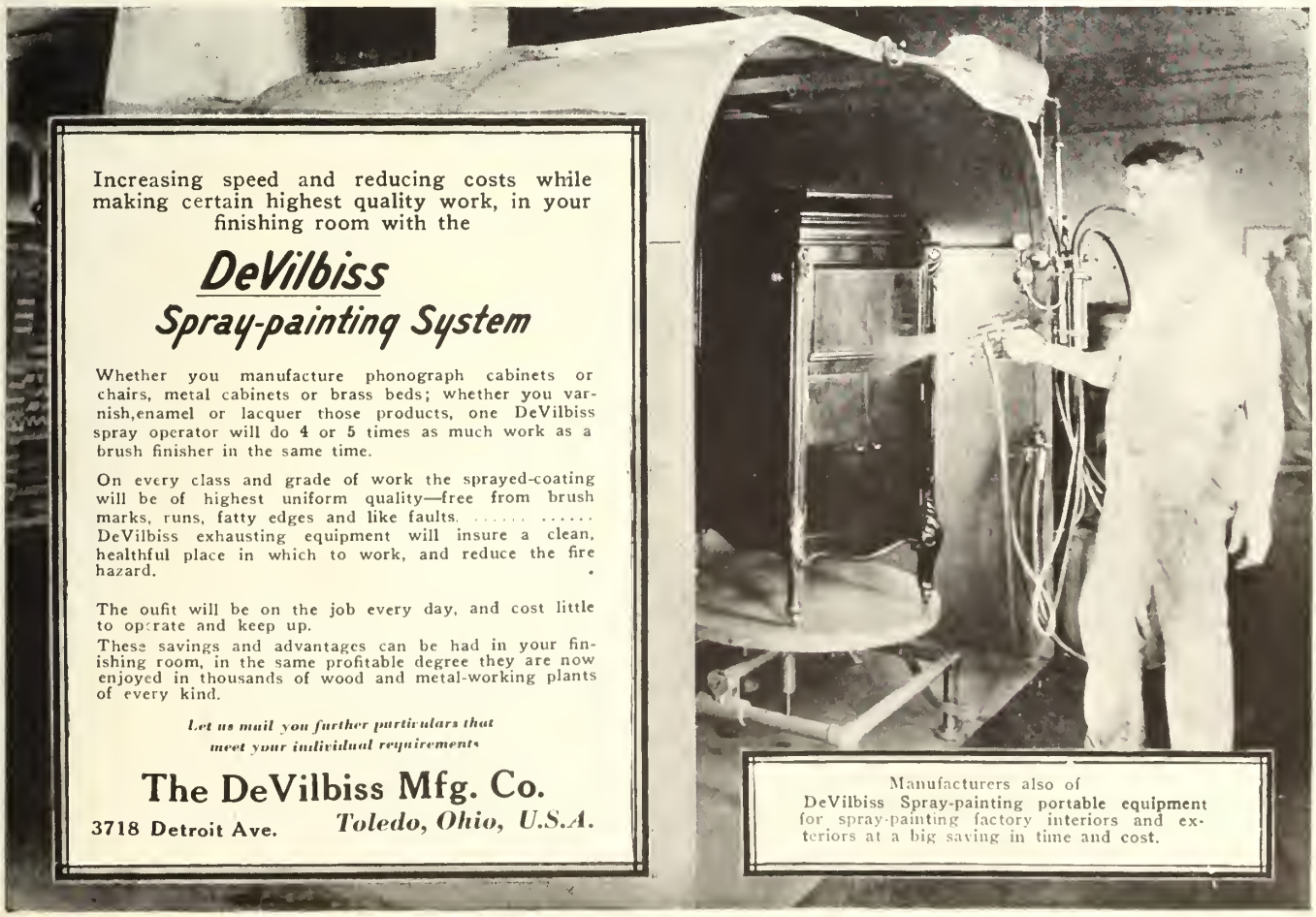
Furthermore, the spray for washing the air in Nichols Drying Equipment is produced in a simple and ingenious manner without the use of the spray nozzles, connecting pipes, pump, and strainers, all of which require so much attention and give so much trouble.

We urge manufacturers to ask us for description of apparatus and for records of its accomplishments, saving single manufacturers many thousands of dollars in reducing the time the product is held up in drying, and increasing the quality besides..

A. S. NICHOLS COMPANY Aeolian Hall New York City

Manufacturers also of

Nichols Lumber Dryers, Veneer Dryers and Hydraulic Pumps



Increasing speed and reducing costs while making certain highest quality work, in your finishing room with the

DeVilbiss
Spray-painting System

Whether you manufacture phonograph cabinets or chairs, metal cabinets or brass beds; whether you varnish, enamel or lacquer those products, one DeVilbiss spray operator will do 4 or 5 times as much work as a brush finisher in the same time.

On every class and grade of work the sprayed-coating will be of highest uniform quality—free from brush marks, runs, fatty edges and like faults. .... DeVilbiss exhausting equipment will insure a clean, healthful place in which to work, and reduce the fire hazard.

The oufit will be on the job every day, and cost little to operate and keep up.

These savings and advantages can be had in your finishing room, in the same profitable degree they are now enjoyed in thousands of wood and metal-working plants of every kind.

Let us mail you further particulars that meet your individual requirements

The DeVilbiss Mfg. Co.

3718 Detroit Ave. *Toledo, Ohio, U.S.A.*

Manufacturers also of
DeVilbiss Spray-painting portable equipment for spray-painting factory interiors and exteriors at a big saving in time and cost.

NATURE'S HANDIWORK

THE greatest designers of furniture owe their best work to their use of natural forms.

Nature herself, the supreme designer of things beautiful has pencilled the perfect patterns to be found upon "Birds Eye Veneers."

It is with a respect for this natural beauty that the manufacturers select and prepare "Birds Eye Veneer" for your finest furniture.

Use "Birds Eye" where you want excellence combined with practical adaptability.

BeVeCo VENEERS

BIRDS EYE VENEER COMPANY

ESCANABA MICHIGAN

Veneers and Panels

Moisture--The Cause of Many Troubles

At Bottom of Majority of Troubles Common to Veneering and Veneered Stock—How it May Be Combatted

By S. N. JOHNSTONE

Moisture is the foe of satisfactory veneered work and must be guarded against and combatted at all stages of the veneering operation. This fact should be so emphasized and accentuated that it would be taken to heart and acted upon by all who have anything to do with veneered or plywork. A decided improvement in the quality of the veneered work and plywood being placed on the market, would result.

It might prove interesting and helpful to readers of the "Canadian Woodworker and Furniture Manufacturer" if a few of the most prevalent troubles, which can be laid at the door of moisture, were outlined, as it might tend to indicate why certain troubles occur and how they may be overcome. Once the cause is definitely known, the remedy usually suggests itself. For this reason we can tackle any veneering problem more intelligently if a persistent offer is made to ascertain the cause or causes rather than apply a haphazard remedy.

Blindly Groping for Better Results

This point was brought to mind recently in an article in which the writer stated that after being troubled with warped panels for a long time and after having tried every imaginable remedy, they accidentally discovered that the piling of the panels on sticks and allowing them to stand for a few days, gave them freedom from warping. They continued piling in this manner for months without knowing the why or the wherefore, being content with the result. The glue moisture in the panels was the cause of the warping, and piling on sticks simply meant that the moisture was given a chance to escape, and that at the same time the panels were held straight. If an attempt had been made to determine why they had had so much warping, it is probable that the solution finally hit upon would has been put into force much sooner, and considerable annoyance and expense would have been saved.

To return to the question of moisture, every effort must be made to make sure that the stock going into the cores is perfectly dry. This is absolutely essential, more particularly if different woods are mixed in the same core. In the latter event if the stock should contain some moisture, the shrinkage which occurs as the wood dries, would vary for each kind of wood, causing depressions which would be noticeable in the finished article. It is, therefore, essential that the stock be thoroughly dry, and advisable and preferable that each core be made of the same kind of wood.

Moisture Causes Sunken joints

Another trouble or fault which occurs far too frequently is sunken joints. Many a high-class piece of furniture has had its beauty and durability reduced by this common defect. The cause is glue moisture at the core joints, and the remedy is to make sure that this moisture has been eliminated or equalized before the cores are surfaced and the veneers laid.

This same line of thought could be carried along almost at much greater length and such troubles as face checks, open joints, warping, twisting and other faults common to veneered work analyzed, and in each instance the main contributing cause would be found to be moisture. That being the case, it is not any wonder that the statement is often made that moisture is the glue-room man's worst enemy.

Knowledge Not Lacking

Knowing the cause of most of our troubles, knowing the effect of moisture on wood, knowing how wood acts and re-acts as moisture is absorbed and dried out, and knowing how moisture should be eliminated at every stage of the veneering operation, it is difficult to understand why so much veneered work is found upon the market which bears unmistakable testimony to the fact that due care had not been exercised when the article was being made. There is no excuse, other than carelessness, or a gross disregard for quality of output in an effort to make as large a profit as possible.

Whatever may have been the measure of excuse in the past, there is none to-day. We have the knowledge; we know how and why, and what is more to the point, we have the equipment: efficient lumber-drying kilns for core stock, redrying equipment for handling veneers and crossbanding before laying, and panel-drying kilns, which will take care of the glue moisture in the panels and veneered stock, so that it is strictly up to each and every manufacturer to give this phrase of the work closer attention and see that his product is free from defects traceable directly to moisture.

Clamp Carrier in Heated Compartment

One large furniture manufacturer has hit on the idea of enclosing his revolving clamp carrier and heating the compartment with steam pipes. In this way the glue between the joints hardens quicker and the glue moisture is eliminated more rapidly. Another feature is that as the stock would be warm as it is carried around the carrier, a better joint would result. This same manufacturer warms the pieces to be glued by placing them on a series of chains which carries the stock through a warming compartment to the glue rolls which are situated at the far end and adjacent to the clamp carrier.

Merger of Veneer and Plywood Associations

Stronger Organization to Guard and Further Interests of Veneer and Plywood Industry —Expect Early Action on Freight Rates Case—H. B. Sale Heads New Association

Of interest to users of veneer and plywood is the merger of the National Veneer & Panel Manufacturers' Association and Plywood Association, which was consummated in Chicago last month. This action can hardly fail to have a beneficial effect on the interests and activities of the veneer and panel industry as a unit, the results of which will be to a lesser degree shared by the users of these commodities.

The name of the new organization has not as yet been selected, and for the time being the old name of the National Veneer & Panel Manufacturers' Association will be used. The suggestion has been made that the merged organization might be called the "National Thin Lumber & Plywood Association," although there has been some objection to the elimination of the word "veneer."

H. Brooke Sale, Fort Wayne, Ind., Who Heads New Organization

Has Strong Executive

H. Brooke Sale, of Hoffman Bros., Co., Fort Wayne, Ind., who was elected president of the National Veneer & Panel Manufacturers' Association last December, has been elected president of the new national organization. The executvie, who will work with Mr. Sale, includes the following gentlemen:—H. E. Kline, of the Louisville Veneer Mills, Louisville, Ky.; H. J. Barnard, of the Central Veneer Co., Indianapolis, and F. B. Ward, of the Hanson-Ward Veneer Co., Bay City, Mich. M. Wulpi, of Chicago, head of the Central Credit Bureau, Inc., will direct the activities of the new association.

In explaining the merger plan, Mr. Kline, who was chairman of the Merger Committee, said in part:-

"It was thought best by your committee that the nucleus of the present association should be maintained with only a slight change of title and that around it could be built such separate organization as the necessities of the business and the expediencies of the case warrant. Going into more detail, the plywood members are not interested materially in the necessities or the activities of the cutters. The cutters of Birch are very little interested in the cutting of gum or popular. The cutters of walnut are not interested in either of the above woods. The cutters of mahogany are perhaps not interested in any of the foregoing, and we could go on and on.

"The plan of operation as concieved is this—that if the cutters of gum,or birch, or of popular, or of walnut, or of mahogany, or of sawed quartered oak, deem it desirable from a costing or statistical standpoint to have a separate organization, they may do so, electing their own chairman or president as you may term him, which officer becomes automatically a vice-president of the parent body and a member of the executive committee of the parent body. This your committee thinks desirable, as the individual manufacturers of whatever groups may be formed are more acutely interested in the choice of their own executive than would be the entire body of cutters or manufacturers, and by automatically making this executive a vice-president of the parent body or the national association, each group is represented in the executive committee of the national association.

"The commissioner or secretary will function for the parent body as a whole and include in his duties such duties as the individual groups may require. His contract will be with the parent body or the national association and he will be paid by the national association. To provide the funds to carry out the above, assessments will be made: First, against the plywood manufacturing members; Second against the thin lumber manufacturing members; Third, against the associate members as provided for in the new by-laws.

In discussing the question of merging the two organizations, W. W. Knight, of the Long-Knight Lumber Co., Indianapolis, read a paper on "The Needs of Association Work in the Veneer and Plywood Industry." Mr. Knight discussed this subject under ten headings as follows:—"To Foster Trade," "Encourage Friendship," "Encourage High Standards," "Eliminate Evils of Ignorant Competition," "Preach the Doctrine of costs," "Handle Credits," "Do Legislative Work," "Promote Mutual Insurance," "Establish and Administer a Code of Ethics" and "Conduct Arbitration Proceedings."

It is anticipated that the added weight of the new organization will be instrumental in effecting reductions in the high freight rates under which the industry is laboring. The transportation problems are among the most serious with which the veneer and panel industry is confronted. At the present time the railways are charging unreasonably high rates for carrying veneers and panels. Under a recent ruling of the Railway Commission, the carriers were instructed to apply lumber rates, or rates closely related to lumber, to veneer and plywood. At the present time a cause is pending before the Interstate Commerce Commission, asking that the Commission issue an order directing the railways to put these lower rates into effect. It is hoped that eventually it will be possible to secure reductions which will run from 25 to 40%.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.

Buyers of Veneers and Panels

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in this publication. They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend his time and money to get in touch with you. He deserves it—if his stock and prices are right.

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.

(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

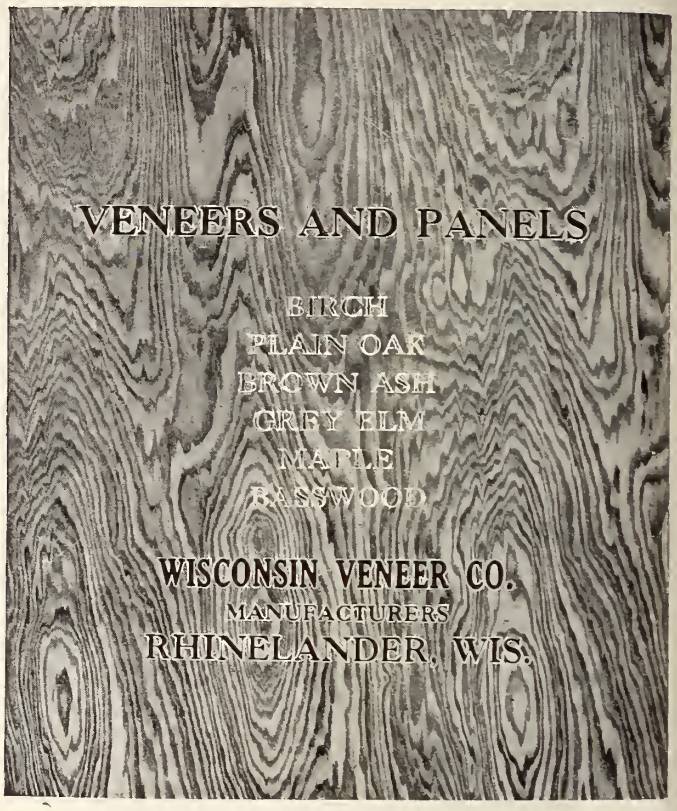
Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.



Litton Veneer Co.

Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill

ROCKFORD - ILLINOIS

J.W.Frye Lumber and Veneer Co.

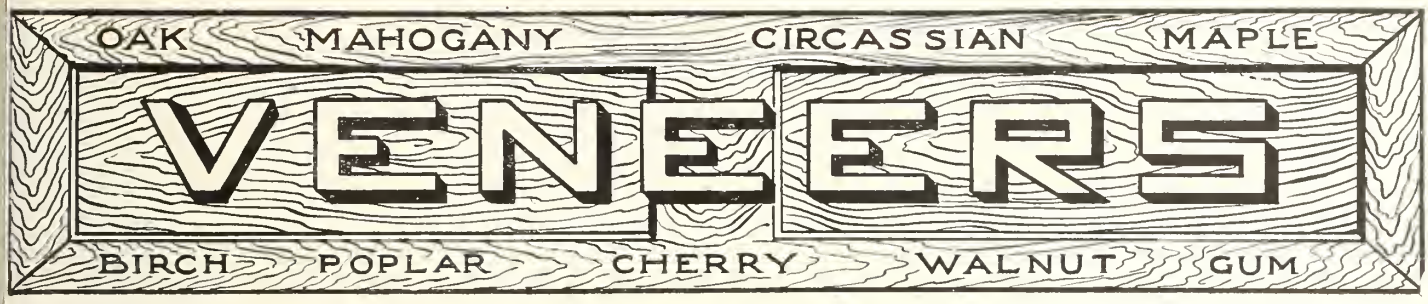
Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers
Oak Lumber and Veneers
Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown



Poplar and Walnut Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND

HOFFMAN BROS. CO.

ESTABLISHED 1867 - INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car 1/20′ Red Oak (log run)
½	Car 1/16′ Red Oak (log run)
½	Car 1/20′ White Oak (log run)
½	Car 1/16′ White Oak (log run)
1	Car 1/28′ Walnut (half round)
25M	1/28′ Poplar Crossbanding
5	Cars 1/8′ Poplar (log run)
2	Cars 1/8′ Poplar (corestock)

Prices by wire on receipt of your inquiry

HB
Reg U S Pat Off

FORT WAYNE, IND.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

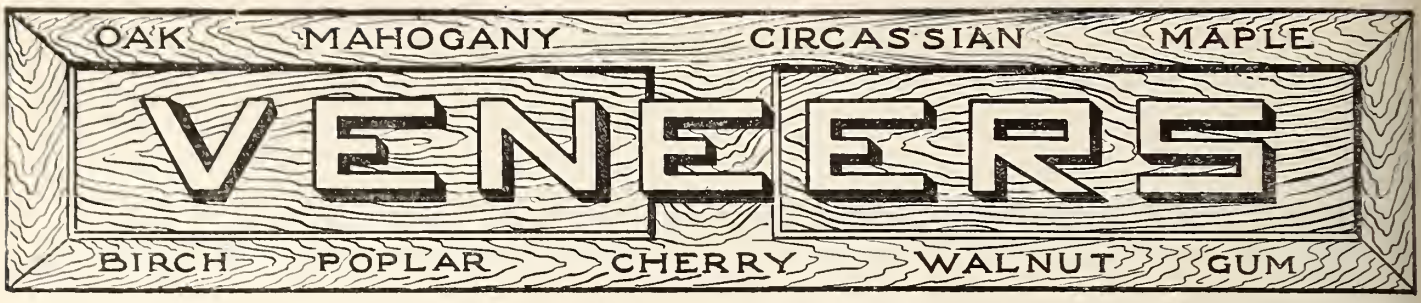
The Standard Veneer Co.
Portland, Maine

Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

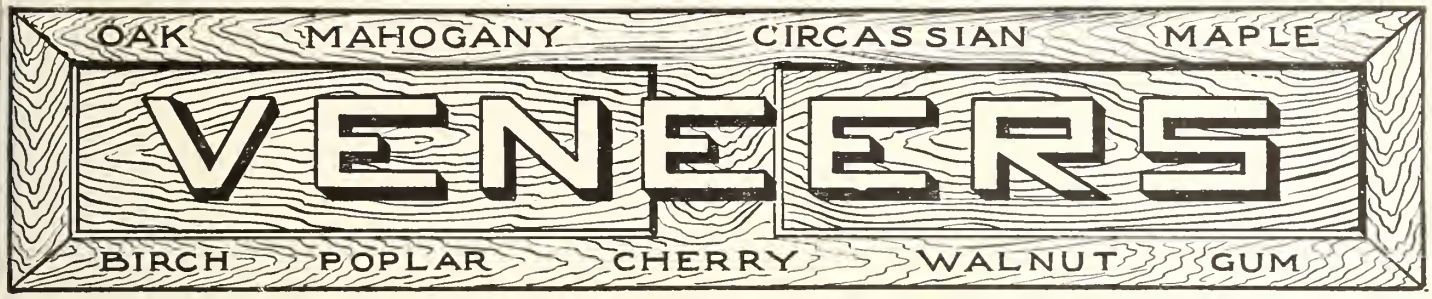
May we know your requirements early?

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.



VENEER MANUFACTURERS COMPANY

MANUFACTURERS IMPORTERS

QUALITY VENEERS AND PANELS! THE BEST IN ALL KINDS!

ROTARY CUT, SLICED AND SAWN, FIGURED AND PLAIN

DOMESTIC AND IMPORTED STOCK!

We are located on the Chicago Junction Ry. which enables us to receive from and ship to all parts of the world on short notice.

Send us for requisitions for dimension sizes in gum and poplar.

1036 W. 37th. St. Chicago, U. S. A.

QUALITY *SERVICE*

PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut

Exclusively

Woodruff and River *New Albany, Ind.*

THIS is the principal Ware House and the Shipping Department, where the veneers are crated and loaded into box cars or on our own trucks for the short haul to Baltimore Harbor.

Photo by Hughes

Quality VENEERS

in WALNUT BUTTS
BURLS · OAK · POPLAR
LONG WALNUT
MAHOGANY ETC.

Mills – Baltimore, Md.

Sales-Branches:

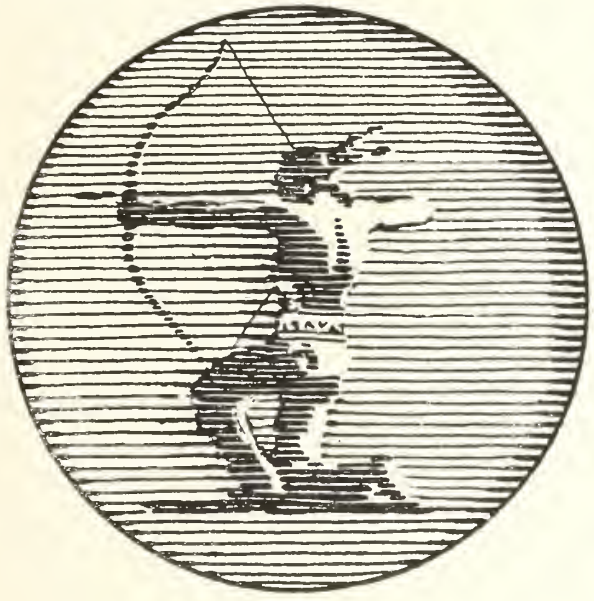
NEW YORK (709 SIXTH AVENUE) HIGH POINT
CHICAGO (28 E. JACKSON BOUL'V'D.) JAMESTOWN

THE WILLIAMSON VENEER CO.

VIEWS OF OUR PLANT No. 7.

H.G.W. Del.

ALGOMA *the Better* Plywood



What does it mean when you see this trade-mark?

"Algoma"—of course—and "Better Plywood" will come to the mind of every man who has read our monthly message for the last year.

But what more does this trade-mark mean? Study it. The kneeling Indian is alert—he expresses readiness on our part to serve your needs with speedy promptness.

His bow, his arrow—these typify Plywood. They tell of lightness combined with strength—of accuracy, such as we maintain in everything we do.

More than this—the Indian symbolizes pioneering. And the spirit of Algoma, since 1886, has been above everything else a pioneering spirit—seeking out better ways of making Plywood, searching for new things which could be better made of Plywood—investigating, improving, perfecting—building a service in Plywood which is today more complete in every line than any other service in the United States.

Remember these things when you see this trade-mark. Remember them when you want Plywood. Bent work, extra large panels, stock panels, beautifully figured woods, the lastest importation of Circassian Walnut—you find them all at Algoma, and you can get them in Algoma, the Better Plywood.

ALGOMA PANEL COMPANY, *Algoma, Wis.*

Black Walnut

Band sawn stock.

Steamed carefully and uniformly.

Unexcelled facilities for Kiln drying.

Prepared to ship in mixed cars.

Ample stock in all thicknesses.

Wood Mosaic Company

INCORPORATED

LOUISVILLE KENTUCKY

Main Office now located in Louisville, Kentucky

C. L. WILLEY COMPANY

The Largest Veneer Plant in the World

A BURL, correctly prepared, carefully cut, and properly dried, gives the cabinet-maker real joy and satisfaction, for it enables him to display his skill to the best advantage. The Burl shown here is not now available, but we have others as good, or better, ready for prompt shipment, and more coming in all the time.

Tell us the type of figure you want—in Veneer of ANY wood—and we will send you selected samples, and quote prices.

Veneer & Lumber

Walnut
American and Circassian
Mahogany
Quartered Oak
English Oak
Satinwood
Vermilion
Teak
Rosewood
And many other Foreign and Domestic Woods

(1752)

OUR world-wide organization—the broad experience of our men—our well established policy of fair dealing at every point of each transaction—these are some of the things that give you assurance of satisfaction when you come to us for Veneer or Lumber.

You will find us fully prepared to supply the users of highly figured Veneers with a breadth of choice and a promptness of delivery not surpassed by any plant in the world.

C. L. WILLEY COMPANY

2558 South Robey Street

CHICAGO

Grand Rapids **Michigan**

Jamestown **New York**

Development of Waterproof Glue

Cannot be Called New Product—Many Examples of Wood Glued With Casein Found in Ancient Ruins—Prepared and Used Cold

By H. L. PRESTHOLDT*

Prior to the war, on this continent commercial waterproof glue was in the main unheard of. Almost simultaneously with the war a demand for waterproof glue developed. It was heralded as a new thing. Its merits were questioned to the utmost degree, and not until the United States Bureau of Standards had been so convinced as to set up standard specifications for waterproof glue to be used on government contracts did the glue enter the market as a competitive article.

But, casein waterproof glue is not really new like some of the things which science continues to discover from time to time. Its true age cannot be calculated. We know that a form of casein glue was used by the ancient Chinese, and it is not at all improbable that the very first glue known to humankind was an unscientific mixture of coagulated milk and alkali. The ancient Egyptians used the same combination for fixing together pieces of wood, particularly for enriching poorer grades of wood by surfacing them with a thin layer of fine veneer. The Greeks used the same principle. Thus, casein glue, formerly looked upon as an innovation, is really the re-establishing of a lost art.

Was Known to Ancients

We find, for example, that shipbuilders nowadays employ a covering of canvas or linoleum affixed with waterproof glue. This is virtually the same construction as was used by the great Roman Emperor, Trajan. One of his boats sunk in Lake Nemi, fifteen miles from Rome, in about the year 100 A.D. was recently discovered. Alberti V. says of it: "I found the timber in excellent preservation, which besides a coating of black pitch had a double covering of canvas glued on." Analysis of the glue proves it to be a casein product.

The Romans ruins have yielded many valuable examples of rare woods glued with casein glue. Such pieces of furniture embodying beautiful designs commanded fabulous prices, seventy-five thousand dollars being paid in one instance for a slab to be cut into surface veneers. Much of this furniture is practically intact today after many centuries.

Made From Ordinary Milk

The principal ingredient of casein glue is a milk product. Briefly, it is the dried curd of cow's milk. In some of the older countries of Europe it has long been the practice to mix fresh curd with lime and apply it immediately to the surfaces to be glued together, making a strong and waterproof glue joint. This simple formula is the pride of many an European cabinet-maker even today, coming down generation by generation from the medieval period. This by the way, is exemplary of the careful, patient workmanship exercised by medieval craftsmen, and accounts for the sturdy qualities of many of the massive carved and inlaid cathedral and castle chairs of Middle Europe, already centuries old, and good for many more.

This crude method cannot be practical to present day Commerce since the glue cannot be prepared at a central point and distributed for use by the consumer. We live in that advanced period of civilization when distance is measured in hours, not miles, and a consumer in any part of the world, one might say, expects to use the same materials as another consumer who is near a source of supply in another part of the world. Vast systems of transportation have enabled us to accomplish these very things.

Comes Ready for Mixing

So with glue it was necessary, in order to supply that powerful demand for commercial commodities, that the glue be rendered commercial. Scientists therefore, set themselves to the task of creating a commercial waterproof glue. Step by step they progressed, offering first several parts of the glue to be mixed by the consumer. The number of necessary operations and ingredients were gradually decreased until now we have casein waterproof glue in its perfection, a commodity which can be manufactured complete. It embodies many chemical ingredients scientifically prepared and proportioned. It is packed in barrels or other suitable containers, shipped to all parts of the world, stored and handled indefinitely. The glue is rendered fit for consumption by simply mixing the glue powder with cold water. There is nothing superfluous nor lacking, nothing intricate, nothing difficult.

Those who manufacture for export find it advisable that they use waterproof glue because it will pass through the humid tropics anaffected by heat, moisture and exposure, and without being attacked by those curious little red ants which eat the ordinary glue, leaving a veneered table leg, for example, like a loose, baggy trouser.

Finding Many Uses

It is interesting to note also the many articles on the market today depending directly upon waterproof glue. Untold quantities of waterproof plywood are being used and adopted for use in innumerable constructions such as automobile bodies, laminated frames and exterior doors and panel work. There is a host of special articles such as wood-disc wheels, plywood pulleys, friction heads, patterns in the various shops of custom builders, finished carved surfaces, wall board, operations for affixing wood to metal, hat blocks, toys, and in the shoe industry for gluing felt padding to leather. In a larger sense, casein waterproof glue can be used wherever any glue is used, which opens up that vast field of industries which only a keen imagination or a calculation of statistics could visualize. It has been pointed out that glue probably enters into the manufacture of more completed articles than any other single commodity. For, wherever we find wood it is likely we will find a dash of glue on it somewhere.

Furniture and panel manufacturers find that with very little additional equipment or perhaps only

(Continued on page 96)

*President, Monite Waterproof Glue Co., Minneapolis.

TORONTO HARDWOOD LUMBER COMPANY LIMITED

(Formerly Lumber Dept., Toronto Veneer Co. Ltd.)

Head Office:
1100-1104 Queen St. W., TORONTO. Phone Park, 6980
Yard: Atlantic & Hanna Aves. Grand Trunk Ry. Toronto.

Montreal Office:
424 Power Bldg. Phone Main 8725
Saw-mill: Louisville, Ky.

Walnut	White Ash	Birch
Mahogany	Gum	Basswood
Yellow Poplar	Cottonwood	Beech
White Oak	Sycamore	Maple
Red Oak	Cypress	Elm
Chestnut	Yellow Pine	
	Tennessee Red Cedar	

Ample stocks of the above woods yarded in Toronto. Kiln-dried stocks shipped if desired.

Carload shipments made from our Band-mill at Louisville, where our manufacturing and yarding facilities are unexcelled.

If you are not receiving our monthly stock and price lists, please send us your name so that we may place you on our mailing list.

OUR SPECIALTY—INDIANA FORKED-LEAF WHITE OAK.

An unchanging high standard is your assurance of the utmost in Quality and Service when buying

PANELS LIMITED

Southampton - - - - Ontario

TOPS
CASE GOODS
FLUSH VENEER DOORS
3 AND 5 PLY PANELS
3 AND 4 PLY TABLE RIMS
5 PLY RIM BOUND TABLE TOPS

On hand for Immediate Shipment:
Stock Panels in Mahogany, Walnut, Oak, Birch, Etc.,

Sizes	24 x 60	30 x 60
	24 x 72	30 x 72

Selling Agents:

Toronto Veneer Co., Ltd. 1100-1104 Queen St. W. Toronto

Packing Should Receive More Attention

(Continued from page 80)

their shipments to be crated, that they would then crate them. Conferences with a considerable number of retailers bring out the fact that they now get from the carriers not over one-quarter of the actual damage to their goods and in addition have many dissatisfied customers. Frequently customers order goods which are not in stock, which the retailer then orders from the manufacturer. If they arrive in poor condition and must be refinished, the customer who knows the goods are to arrive at a certain time is dissatisfied with his purchase, because of the delay caused by the refinishing, and imagines all sorts of imperfections even though none exist. All those retailers to whom I spoke said that they would be willing to pay for better packing if all the retailers had to pay for it.

Should be Given Freight Preference

From investigations carried out to date it would appear that for a solid carload of furniture loaded by the shipper and unloaded by the consignee the separate pieces need not be packed nearly as well as for a less carload shipment of the same article, which has to be transferred several times, loaded with other freight and carted to and from the carrier. It is also thought that a shipment that is well crated according to a specification prepared from an engineering standpoint and designed to overcome the most frequent causes of damages to crated articles should be charged a lower rate than one that is merely protected, say with excelsior pads, or even burlap. Case Goods Manufacturer.

Development of Waterproof Glue

(Continued from page 94)

slight adjustment and alteration of the equipment they already have that waterproof glue may be adopted expediently. In so doing they have only one kind of glue to mix and handle. They have determined further that it takes very little time and labor to prepare waterproof glue because the preparation embodies simply measuring the glue powder and the water and mixing them with rapid agitation in a machine. Each batch requires only ten or fifteen minutes.

The retaining clamps may be removed and the material machined or allowed to dry naturally after two to four hours, thus giving access to clamps and caul boards to be used over again during the same day's production. Incidentally this permits the complete order to go through the mill without changing the saw and sandpaper set-ups.

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.

This photograph was taken of our exhibit at the Indianapolis Industrial Exposition held in Indianapolis last fall, which was attended by more than 150,000 people. Our exhibit was pronounced the finest display of Hardwoods and Veneers at the exposition.

WE HAVE THE FOLLOWING VENEERS READY FOR IMMEDIATE SHIPMENT:

1-20" Qt. Sawed White Oak
1-16" Qt. Sawed White Oak
1-8" Plain Sawed Red Oak
1-8" Cherry
1-8" Walnut
1-28" Walnut Sliced

2,000,000 Feet of Indiana Hardwood Lumber

F. M. BACHMAN CO., INDIANAPOLIS, IND.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

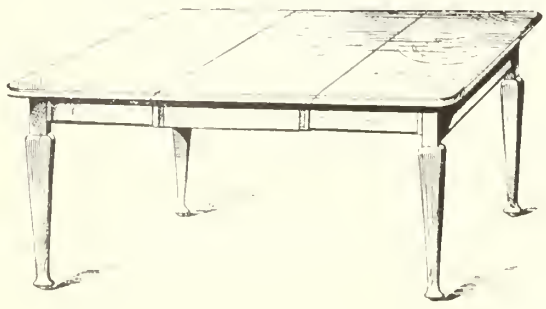
LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

PROMPT delivery in any quantity at very attractive prices. Just let us know your requirements and we shall be glad to forward quotations.

Panels are made in Walnut, Quarter Oak, Birch, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.



HAY & CO., Limited Woodstock, Ont.

The Lumber Market

Domestic Woods

The demand for Canadian hardwoods is showing a gratifying improvement. One lumber wholesaler recently intimated that he did not have any complaint to make as far as volume was concerned but that he was not satisfied with present price levels as the business being done continued to show a loss. It is hard to determine just what to-day's prices are, the spread or variation running in some cases as high as $25.00, depending largely on how badly the seller needs the business and how persistent the buyer is in his efforts to force lower quotations. Buying on the part of the automobile manufacturer is about over. The lumber this industry has purchased, together with the stock carried over from last year, should last until well on into the summer. Furniture manufacturers and other users of local hardwoods have entered the market in larger numbers and are displaying an increasing willingness to buy. This is due in part, at least, to a realization of the fact that the probability of lower prices is very remote and to the possibility that values may stiffen. Some stocks are in weaker hands and are from time to time being offered at various concessions. This has a demoralizing effect on the whole market, and is one factor which is tending to prevent a return of confidence which means buying on a larger scale. The impression seems prevalent that these stocks will be pretty well cleaned up during the next few months and that when this is an accomplished fact, the tendency will be toward slightly higher prices. One wholesaler remarked that he noticed a broadening out in the demand for hardwoods. This means that other industries are coming into the market and may tend to increase prices. There are few, if any, indications pointing toward lower values but every promise that quotations will go higher.

Imported Woods

It is difficult to form a clear idea of conditions in the various American producing centres as there is, apparently, a conflict of opinion. Some reports received indicate a marked improvement in demand with a tendency toward firm, if not higher, prices, while other reports point to a continuation of the present quietness and to price recessions by manufacturers who are anxious to make sales. In the southern areas weather conditions are such that lumbering and logging is almost at a standstill. In some localities it is predicted that active producing operations cannot be undertaken for from 60 to 90 days. All this cannot fail but have an effect on the market as it tends to prevent an accumulation of stock. It has already had the effect of bringing many heavy hardwood users, such as flooring manufacturers, into the market in an effort to cover their requirements for some months to come. Prices are, on the whole, firm though some stocks have been sold at slight sacrifices. Any wood users who are in need of stock or who will require lumber during the next month or two, would be well advised to book their requirements now for if they put off buying, it is doutful if they will not be forced to pay slightly higher prices when they enter the market.

Memphis, Tenn. As a result of interference with production due to weather and flood conditions, the consuming interests have shown a greater anxiety to place orders. This is evidenced by the fact that several orders were placed recently, calling for deliveries over a period of three or four months. While this was a feature of the market some years ago, the practice has not been in evidence during recent months. Where business is booked for future delivery, the lumber manufacturers are insisting upon prices prevailing at the time of shipment as they are thoroughly convinced that the next few months cannot fail but show enhanced values. There is a much better tone reported in the Memphis market with more buyers, a larger volume of business being done and prices holding form.

Louisville, Ky. The hardwood trade in this district is badly handicapped by flood conditions which are prevalent in the South. Shipping is difficult because of conditions imposed by the high water. Many of the streams and rivers reach such high levels that not only were the mills nuable to secure the logs necessary to maintain production but were, in many instances, forced to close down entirely. Recent quotations, f.o.b. Louisville, are as follows:— Plain FAS inch oak, $110; common, $55; quartered oak, $140 and $70; poplar, $110; saps and selects, $80; common $50; quartered red gum, $115 and $70; plain red gum, $100 and $62.50; sap gum, $45 and $31; walnut, $250; selects, $175; common, $105.

Evansville, Ind. The report from this district indicates an increased activity with prices on certain grades showing an upward tendency. Gum is in strong demand, the furniture industry being the chief buyer in the field. The call for oak is also showing surprising strength.

Carborundum Appoint Dist. Sales Manager

W. W. Sanderson, General Sales Manager of The Carborundum Company, Niagara Falls, N. Y., announces the appointment of Harry Fowler as District Sales Manager of the Cincinnati territory of the Carborundum Company to succeed Charles R. Cox. The appointment of Mr. Fowler is effective July 1st. Mr. Fowler will take charge of the Cincinnati District. Mr. Cox will be transferred to the main office of The Carborundum Company at Niagara Falls, N. Y., where he will take up his new duties on sales statistics.

Advertising is a Locomotive

William Wrigley, Jr., is spending $10,000 a day, over three and one-half million dollars a year, for advertising his popular brand of chewing gum. To a friend who remonstrated, saying his product being so well and widely known did not need such enormous outlay of money for further advertising, Mr. Wrigley said: "My friend, we're riding on a train. What would happen to this car if the locomotive were disconnected and went on ahead? Well, that's what would happen to my business if I stopped advertising."

Many a mill man can have the most honest staff in the world, yet be robbed daily by poor bearings, tight belts, badly sharpened saws and indifferent machines.

Suggestions of Live Current Items

The usual famous Anderson-Tully service stands behind every foot of the following list of specials which we are pleased to offer the buying trade:

QUARTERED WHITE OAK

4/4 FAS 150,000

Full product of the log in this grade. Stock containing all of the 10" and wider produced, average 7½" for width, 45% to 55% 14' and 16' lengths.

4/4 No. 1 Com. & Selects .....150,000'

Full product of the log in this grade. 45% to 55% 14' and 16' lengths. Stock 8 to 12 months dry.

QUARTERED SYCAMORE

6/4 No. 1 Com. & Bet ..... 75,000'
5/4 No. 1 Com. & Bet. ..... 40,000'

Sycamore is beautifully figured stock, band sawn and equalized, 7 to 8 months dry. 55% to 60% 14' and 16' lengths. All wide in this stock.

LOCUST

4/4 Log Run .....One Car

SOUTHERN SOFT MAPLE

5/4 Log Run .....100,000'
(Worm holes no defects)
10/4 Log Run .....100.000'
(Worm holes no defects)

PLAIN RED OAK

5/4 Common & Select .....60,000'

PLAIN SAP GUM

5/8 FAS .....150,000'

PLAIN SYCAMORE

5/8 No. 2 Com. & Bet.....100,000'
6/4 No. 1 Com. & Bet. ..... 100,000'

Both items running 60% long lengths. Band sawn and equalized and 7 to 8 months dry.

HACKBERRY

5/4 No. 1 Com. & Bet. ..... 150,000'

Band sawn, thoroughly dry, and high grade in every particular.

HICKORY

8/4 No. 2 Com. & Bet. ..... 200,000'
6/4 No. 2 Com. & Bet. ..... 100,000'
10/4 No. 2 Com. & Bet. ..... 20,000'
12/4 No. 2 Com. & Bet. ..... 30,000'

WILLOW

We make a specialty of Willow in 4/4 to 8/4 thickness, and have a stock of this wood. We particularly want to move

4/4 No. 1 Common ..... 200,000'
5/4 FAS. ..... 40,000'
6/4 No. 1 Com. & Bet. ..... 100,000'
8/4 No. 1 Com. & Bet. ..... 50,000'

All of this stock thoroughly dry.

Discriminating buyers will find that it pays to be linked with an organization and service so truly founded on an understanding not only of the manufacture of lumber, but of its proper merchandizing and utilization.

ALL STOCK SIX MONTHS AND BETTER DRY

ANDERSON-TULLY COMPANY

MEMPHIS, TENNESSEE

ATCo (MEMPHIS) SOUTHERN HARDWOOD LUMBER & VENEER

News of the Trade

The woodenware factory of Thomas Moore, Rodney, Ont., was slightly damaged by fire recently.

D. S. Cluff, Port Elgin, Ont., is negotiating for a building in which to establish a general woodworking plant.

Lindsay Rattan Co., 191 Adelaide St. W., Toronto, was recently registered with Wm. H. Lindsay as proprietor.

Wilfrid Chicoine, Rigaud, P. Q., contemplates erecting a two-storey sash and door factory, 30 x 35 feet.

J. E. Fraser & Co., Pembroke, Ont., makers of musical instruments, recently suffered a loss by fire.

Wm. Pratt, secretary of the Petrolia Wagon Works, died recently at his home in Petrolia, Ont.

Ed. Vechert recently opened up a cabinet shop at Weston, Ont. He has found business very good and expects to extend his activities in the near future.

Messrs. Lemon & Gonason, Victoria, B. C., were the successful tenderers for the millwork for the new high school which is being erected at Salmon Arm, B. C.

Wm. Townsend, aged 87, died at the home of his son in Toronto. The deceased for many years conducted a cabinet and upholstery business.

The Vetcraft Toy Workshop, 160-164 Dupont St., Toronto recently suffered a fire loss of about $35,000. About 90 men are temporarily thrown out of work.

Gigaire & Plant, Shawinigan Falls, P.Q., manufacturers of sash, door and general woodwork, have added a 42-inch C.M.C. band resaw to their equipment.

The Ross Boat & Canoe Co., Orillia, Ont., recently opened an up-town showroom where they are making a display of their complete line.

Morin & Frere, Cap de la Madeleine, P. Q., have commenced work on a small planing mill. The building is to be one storey 30 x 40 feet.

A. & E Belanger, Valleyfield, P. Q., are remodelling a factory for the purpose of manufacturing sash, doors and general woodwork. Some equipment will be required.

Myers & Co. of Valparaiso, California, are reported to have taken a five-year lease on a floor of 118 Sherbourne St., Toronto Ont., and will manufacture desks and furniture.

A new clothes pin factory was recently put into operation at Nelson, B. C. The new mill cost $20,000.00, employs 20 people, and will use 120,000 feet B.M. of birch each year.

A. R. McDiarmid, Limited, Brandon, Man., has been awarded the millwork contract for the new $300,000. building erected in Winnipeg by the Great West Life Assurance Co.

It is reported that Cooper & Moore, Buffalo, N. Y., makers of billiard tables have leased premises at 192 Terauley St., Toronto, and will undertake the manufacture of billiard tables.

George Valentine vice-president of the Massey-Harris Co., Toronto, has been appointed president of the Bain Wagon Co., Woodstock, Ont., which is controlled by the Massey-Harris Co.

Brown & Rutherford, Winnipeg, Man., have been awarded the woodworking contract for the new $55,000 office building which is being erected by the Northern Life Assurance Co.

W. E. Phillips Company, Limited, Oshawa, Ont., have been incorporated with a capital of $150,000 to manufacture mouldings, frames, furniture and other wooden articles Two of the incorporators are W. E. Phillips and R. S. McLaughlin, both of Oshawa.

The plant of the Frame & Door Co., Mount Dennis, Ont., was completely destroyed by fire recently. This factory had only been in operation one week when the blaze occurred.

The contract for the millwork for 34 residences being erected at Mount Royal, P.Q., by the Rockland Housing Co., Montreal, has been awarded to M. Desjardin & Fils, Terrbonne, P.Q.

The Cranbrook Sash & Door Co., Cranbroock, B. C., is shipping lumber and dimension at the rate of 15 cars per week. The greater part of this is going to the big irrigation projects at Kipp, Alberta.

The Fletcher Lumber Co., Windsor, Ont., have commenced work on a planing mill and general office. The planing mill is to be one-storey 30 x 50 while the office building is to be 24 x 24.

Unique Rims, Limited, Toronto, have been incorporated to manufacture and deal in automobile wheels and rims. Capital $500,000. J. Newman and H. McGladdery, barristers, both of Toronto, are two of the incorporators.

Andrew Henderson, who operates a planing mill at Cheltenham, Ont., was badly burned recently in an attempt to check a blaze which started in his plant. The damage to machinery and stock amounted to $5,000.

The H. & E. Furniture Co., Limited, of Milverton, Ont., manufacturers of kitchen cabinets and cedar chests, recently installed a Dodds 20-spindle combination dovetailer, purchased through the A. R. Williams Machinery Co. of Toronto.

Exhibits of work done by night students at the Windsor Collegiate, Windsor, Ont., were recently viewed by hundreds of people. Among the many displays the cabinet making section was especially interesting and included floor lamps, hope chests, rocking chairs, wooden bedsteads and many other articles.

"The Phillips Line"
Window Frame Machines

This is the work ☞

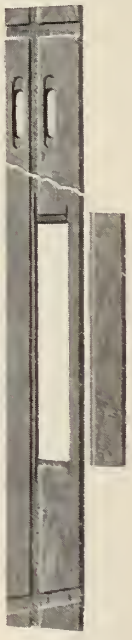
Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.



Atlas Mfg. Co. of Orlando
Orlando, Fla., U. S. A.

TURNER-FARBER-LOVE COMPANY

MANUFACTURERS

HARDWOOD LUMBER AND SLACK COOPERAGE

SUCCESSORS TO

DARNELL-LOVE LUMBER CO. LELAND, MISS.
RUSSE & BURGESS, INC. MEMPHIS, TENN.
LELAND STAVE & LUMBER CO. LELAND & CHICAGO

MEMPHIS, TENNESSEE
U.S.A.

The following is a list of unsold lumber on our yards, nearly all of which is dry and available for prompt shipment. We solicit your inquiries and orders, for straight or mixed car lots.

QUARTERED RED GUM

20,000	5/8"	FAS
12,000	3/4	"
15,000	4/4	"
30,000	5/4	"
18,000	6/4	"
100,000	8/4	"
50,000	5/8	No. 1 C&S
65,000	3/4	"
45,000	4/4	"
30,000	5/4	"
25,000	6/4	"
95,000	8/4	"

PLAIN RED GUM

10,000	3/8"	FAS
30,000	1/2	"
16,000	5/8	"
15,000	4/4	"
12,000	5/4	"
85,000	3/8	No. 1 C&S
112,000	1/2	"
60,000	5/8	"
60,000	3/4	"
30,000	4/4	"
12,000	5/4	"

PLAIN SAP GUM

30,000	1/2	FAS
50,000	5/8	"
20,000	3/4	"
15,000	4/4	"
18,000	5/4	"
60,000	6/4	"
75,000	5/8	" 13/17
75,000	4/4	" "
60,000	4/4	" 18/21
24,000	4/4	" 22/up
16,000	4/4	" 9/12" Box BDS.
120,000	4/4	" 3/17" " "
29,000	3/8	No. 1 C&S
50,000	1/2	"
100,000	5/8	"
30,000	4/4	"
20,000	1/2	No. 2 Com.
95,000	3/4	"
30,000	4/4	"
60,000	8/4	"

QUARTERED RED GUM (Sap No Defect)

50,000	5/8	FAS
50,000	3/4	"
16,000	4/4	"
60,000	5/4	"
95,000	6/4	"
60,000	8/4	"
50,000	10/4	"
20,000	5/8	No. 1 C&S
18,000	3/4	"
16,000	4/4	"
35,000	5/4	"
75,000	6/4	"
15,000	10/4	"

ELM

40,000	4/4	12 & Wdr. Cof. Bd.
36,000	4/4	Log Run
30,000	6/4	Log Run
16,000	4/4	No. 1 Com.
34,000	4/4	No. 2 Com.
19,000	6/4	"
24,000	8/4	"
60,000	10/4	"
10,000	12/4	"
17,000	4/4	No. 3 Com.
6,000	8/4	"
11,000	12/4	"

ASH

50,000	1/2	FAS
14,000	4/4	"
15,000	8/4	"
17,000	12/4	"
80,000	1/2	No. 1 C&S
33,080	4/4	"
10,000	5/4	"
10,000	6/4	"
17,000	8/4	"
10,000	10/4	"
30,000	12/4	"
18,000	4/4	No. 2 C&S
2,500	5/4	"
12,000	8/4	"
17,000	12/4	"
20,000	4/4	No. 3 Com.

QUARTERED WHITE OAK

10,000	1/2	FAS
25,000	5/8	"
22,000	3/4	"
20,000	4/4	"
22,000	1/4	No. 1 C&S
80,000	3/8	"
45,000	1/2	"
95,000	5/8	"
125,000	3/4	"
15,000	4/4	"
45,000	4/4	Strips
35,000	3/8	No. 2 Com.
50,000	5/8	"
50,000	3/4	"

PLAIN WHITE OAK

20,000	5/8	FAS
40,000	1/4	No. 1 C&S
105,000	3/8	"
90,000	1/2	"
110,000	5/8	"
60,000	3/4	"
30,000	4/4	"
50,000	1/2	No. 2 Com.
112,000	5/8	"
50,000	3/4	"

PLAIN RED OAK

25,000	3/8	FAS
80,000	1/2	"
25,000	5/8	"
16,000	3/4	"
3,000	1/4	"
15,000	5/4	"
8,500	6/4	"
105,000	3/8	No. 1 C&S
125,000	5/8	"
80,000	1/2	"
120,000	3/4	"
20,000	4/4	"
6,000	5/4	"
4,000	6/4	"
4,000	8/4	"
105,000	3/8	No. 2 Com.
100,000	1/2	"
115,000	5/8	"
110,000	3/4	"
14,000	3/4	Soundy Wormy
125,000	4/4	"

PANTHERBURN CYPRESS

15,000	4/4	FAS
75,000	5/4	" 4 to 12"
12,000	6/4	" "
50,000	10/4	" "
60,000	12/4	" "
60,000	4/4	" 13 to 17"
40,000	5/4	" "
10,000	10/4	" "
35,000	4/4	" 18 up
24,000	5/4	" "
30,000	4/4	Selects
40,000	5/4	"
115,000	6/4	"
13,000	12/4	"
100,000	4/4	Shop
100,000	5/4	"
30,000	6/4	"
3,000	8/4	"
45,000	5/4	No. 1 Com.
125,000	6/4	"
45,000	4/4	No. 2 Com. Resawn
100,000	4/4	No. 2 Com.
20,000	5/4	"
15,000	8/4	"
150,000	4/4	Boxing
11,000	5/4	"
10,000	6/4	"
175,000	4/4	Pecky

MISCELLANEOUS

15,000	4/4	FAS Cottonwood 13 to 17"
14,000	4/4	Log Run Maple
12,000	6/4	Log Run Maple
80,000	6/4	Log Run Hickory
7,500	8/4	Log Run Hickory
30,000	6/4	No. 3 Com.
20,000	4/4	No. 1 C&B Black Gum
20,000	4/4	No. 2 C&B Qtd. Black Gum
12,000	4/4	No. 2 A & B Com. Pop.

CYPRESS SHINGLES

225,000	4"	Best
250,000	5"	"
175,000	6"	"
225,000	4"	Prime
250,000	5"	"
125,000	6"	"
250,000	4"	Economy
250,000	5"	"
125,000	6"	"

We also solicit your inquiries on Hardwoods, Cypress, Cypress Lath and Shingles. We have a good assortment and suggest that you buy now for your Spring requirements. We can ship mixed cars in thicknesses from 3/8 to 12/4".

It is understood that our stocks are constantly changing by reason of manufacture and shipment. We are prepared to surface one or two sides.

Sole Manufacturers PANTHER BURN Cypress

The capital stock of the Hope Mfg. Co., Limited, 456 Gilbert St., Toronto, Ont., has been increased from $40,000. to $100,000. The company are large manufacturers of doors and other lines.

Priscilla Limited, Toronto, were recently incorporated to manufacture and deal in washing machines, wringers and laundry appliances of all kinds; capital $40,000. J. W. Broudy and T. H. Wilson, barristers, both of Toronto, are two of the incorporators.

Strain & Emery, Limited, Windsor, Ont., were recently incorporated to operate a planing mill and to manufacture and deal in all kinds of wood products. Capital $40,000.00. Two of the incorporators are G. H. Emery and J. W. Strain, contractors, both of Windsor, Ont.

Woodstock Pipe Organ Builders, Limited, Woodstock, Ont., have been incorporated to manufacture and market pipe organs and other musical instruments. Capital $40,000. Two of the incorporators are Charles Bond and H. A. Karn, both of Woodstock, Ont.

The Pacific Box Company, Vancouver, B. C., began extensive repairs the first of this month. The work consists of repairs to flooring and reinforcing foundations of mill, also driving a number of creosoted piles at the end of the mill fronting on False Creek.

Hamilton Iceless Refrigerator Co., Ltd., Hamilton, Ont., have been granted a provincial charter to manufacture and deal in refrigerators, cabinets and kitchen furniture. Capital $50,000. John Pentland, and David Horne, both of Hamilton, are two of the incorporators.

The Breece Mfg. Co., Portsmouth, Ohio, have instituted proceedings against the Aetna Casualty & Surety Co. of Connecticut, for $25,000. This is to indemnify the Breece Company for settlement and costs in the suit brought against them by the Perkins Glue Co.

Woodworking plants in New York State, particularly in the vicinity of New York City, report that the radio telephone craze is bringing them a great amount of business in supplying parts, such as spools or reels for making coils, and wooden cabinets.

The Seventh Annual Convention of the Associated Cooperage Industries of America is to be held at St. Louis, Mo., May 4th and 5th. It is anticipated that a large number of those interested in the cooperage industry, from both Canada and the United States, will be in attendence.

The Cranbrook Sash & Door Coy.'s mill at Kitchener, B. C., is now running with about sixty men, and cars are being shipped in considerable numbers both to this point and to Southern Alberta, where lumber is being supplied on a big irrigation contract.

Young-Canada Products Limited, St. James, Man., were recently granted a provincial charter to manufacture and deal in sash, doors, toys, furniture and other wood products. Capital $20,000. Richard Power, St. James and C. L. Richardson, barrister, Winnipeg, are among the incorporators.

Mr. Ramsay of the J. D. Wallace Co., Chicago, Ill., manufacturers of portable woodworking equipment, was in Toronto recently in an endeavor to size up the Canadian field. This company is considering the advisability of appointing Canadian representatives and making a strong bid for Canadian business.

B. C. Howard & Co., Ltd., Sherbrooke, Que., have been granted a provincial charter to take over the business of B. C. Howard & Co., and to manufacture and market sash and doors, boxes and other wood products. Capital $599,000. Two of the incorporators are B. C. Howard and C. B. Howard, both of Sherbrooke.

Frank Sweeney who is connected with the cooperage industry in Victoria, B. C., recently returned from a business trip in Eastern Canada and the United States. Mr. Sweeney has been strongly advocating the use of B. C. Douglas fir for barrels, maintaining it to be an ideal wood for the purpose.

W. E. Phillips, Limited, Oshawa, Ont., have awarded the contract for their new factory which is to be erected at a cost of $25,000. Mention was made of this project in the March "Canadian Woodworker." The lines to be manufactured include mouldings, mirrors, woodwork of various kinds, etc.

The Myers Lumber & Mfg. Co., 15 Toronto St., Toronto, have commenced work on their plant at Spadina Road and Eglinton Ave., North Toronto. The buildings being erected consist of a two-storey planing mill 70 x 80 feet, one-storey office, 28 x 34 feet, 2-storey stable 34 x 28 feet, boiler house and two-compartment dry kiln.

G. Russell Carrick, Crystal Beach, Ont., has purchased the Crystal Beach planing mill and lumber yard from J. T. James. This business will be carried on under the management of C. H. Haun. In all probability a few changes and improvements will be made, including the installation of a 60 H.P. electric motor. Mr. Haun reports that business is extremely good in the Crystal Beach district.

The plant of the Port Hope Lumber & Veneer Co., Port Hope, Ont., is working to capacity on fruit baskets. It is anticipated that over 1,000,000 will be turned out this season, which is double the output of last year. At the present time 40 hands are employed, many of them working overtime. One of the most efficient basket makers is averaging 70 baskets per hour.

A charter has been granted to the Myers Lumber & Mfg. Co., Toronto, with a capital stock of $200,000. Among the incorporators of the company are William James Myers, lumber merchant, William Warren, manager, Thomas E. Crow and others. The head office of the company is at 15Toronto St., and a yard and factory have been opened up at corner Spadina Road & Eglinton Ave.

In order to secure additional capital to increase the capacity of the present plant, which is in operation at Milner, the Murrayville Toy Company has been reorganized as a limited company, and will in future be known as the Milner Toy Manufacturing Company, Limited. The officers of the new concern are:—President, Q. A. Gosling, Murrayville; vice-president, W. S. Udy, Milner; secretary-treasurer, A. F. Hale, Langley Prairie.

Chestnut Canoe Co., Limited, Fredericton, N. B., have awarded a contract for their new factory building to replace the one destroyed by fire last year. The new plant will have a total floor space of some 40,000 square feet and it is claimed will be the largest canoe manufacturing plant in the British Empire. At the present time the company is operating a temporary plant at full capacity to take care of their many customers.

A provincial charter has been granted the Toronto Hardwood Lumber Co., with headquarters in Toronto and a capital stock of $40,000. The new organization is an associate one of the Toronto Veneer Co., 1104 Queen St. West, and among the incorporators are,—Joseph A. Houde, Wm. A. Dugit, Herbert T. Brewitt, W. R. Jones and Ernest Houde, all of whom are associated with the Toronto Veneer Co. The Toronto Hardwood Lumber Co. will handle all kinds of hardwoods, both foreign and domestic, and is engaging in the business both in a wholesale and retail way. The yards are at the corner of Atlantic Ave. and the G. T. R.

Look for the brand—It's on every board

THE KRAETZER-CURED LUMBER CO.

Your Protection—Our Guarantee

Kraetzer Curing—What It Is

Kraetzer Curing is simply the modern and more efficient application of the treatment of wood relied upon by the artisans of the earlier periods in the construction of their master pieces of cabinet work. Even, now, after the elapse of centuries, we still frequently encounter such pieces in a perfect state of perservation.

This treatment is even more beneficial to Gumwood than to the woods employed in those earlier times. Kraetzer Curing immediately eliminates the sap and gelatinous substance in the wood. It also completely does away with fermentation and the resulting strain and decomposition, which by some is considered a necessary and deterring evil.

Likewise, Kraetzer Curing makes the sap portion of the wood more dependable than the Heart or Red Wood. It can then be used for practically all purposes with equal or greater satisfaction than Red (or Heart) Gum, Birch, Maple or other woods. It is available at materially lower prices.

Send for the Kraetzer-Cured Booklet, and write or wire for quotations.

The Kraetzer-Cured Lumber Co

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

Our Quartered and Plain Red and White Oak, Ask, Hickory, Red Gum and Tupelo is as fine as the highest quality of virgin timber and thorough knowledge of production can produce

THERE IS NONE BETTER

Kiln Drying Facts for Executives

(Continued from Page 59)

in the lumber to retain it in near balance with average atmospheric E. M. C. (equilibrium moisture content) conditions, (commonly 5% moisture although not necessarily correct) the total shrinkage by volume in the perfectly dried board, would be 4/5 of 10% or 8%.

From the shrinkage table it will be seen that Tennessee chestnut for example, shrinks 3.4% radially and 6.8% tangentially or plain and quartered sawn, respectively. As only 4/5 of the total shrinkage would occur in reducing the moisture content to the proper point this would leave 2.72% in the radial direction and 5.44% in the tangential direction. It is therefore obviously impossible to save the same amount in thickness as in width, because whatever the shrinkage in the radial (or plain sawn) direction, it would be approximately twice the amount in the tangential or quarter sawn direction, and the shrinkage to the correct moisture content would be only 8.18%, **none of which could be reduced without injury to the lumber.** It is a fact, well known to those who have made a study of the subject, that the best possible drying practice, unfortunately produces the greatest amount of shrinkage.

There is one certain way of reducing the per cent of shrinkage on the outer dimensions of the boards and that is—case-hardening. In this case the outer surfaces are reduced to a dry state too rapidly, moisture transfusion from the inner fibres does not keep pace with the rate of moisture evaporation from the surfaces and consequently the outer surfaces set rigidly.

New and Used Woodworking Machinery

We Can Save You Money—Look over our partial list and if you do not see your requirements—Write, wire or phone us.

60″ Three Drum Sander Berlin.
42″ Three Drum Sander Berlin.
12″ 4-Side Goldie McCullough Moulder.
7″ 3-Side Cowan & Co. Moulder.
24″ Major Harper Poney Planer.
24″ Major Harper Poney Planer.
10″ Universal Woodworker McGregor Gourlay.
24″ Power Feed Jointer Preston.
C. M. C. Dowelling Machine ⅝, ¾ & 1″ Heads.
36″ Preston Band Saw.
No. 125 Preston Trim & Rip Saw.
1—8′-0″ Mattison Belt Sander.
Roller Top Saw Tables Wood Frame.
Belt Sanders.
24″ Disc & Bob Sander.
6′ Linderman Dovetailer & Glue Jointer.
42″ Jackson Cochrane Band Rip Saw.
38″ American Veneer Presses.
Chapman Ball Bearing Elevating Floor Truck.
Exhaust Fans.
30″ x 12″ McGregor Gourley Double Surfacer.
Power Feed Rip Saw.
Combination Lath Machine, Green.
Motors & Transmission.

GENERAL MACHINERY Company
67-69 Frederick St., TORONTO
TELEPHONE MAIN 2200

Back In Our Stride AND Better Equipped Than In Pre-War Days

Cannons

Large production and world-wide distribution mean 100% value to you.

By adopting a CANNON Glue, you obtain glue insurance.

Adequate stocks of all grades on spot.

CANNON CANADIAN COMPANY, LIMITED

361 Sorauren Ave.
Toronto

81 Grey Nun Street
Montreal

The Sidman Lumber Curing Process

IN

Remodeled or new, Wood, Brick or **Concrete** Buildings.

Fillers and glazes to preserve the building.

The TAG-ROESCH **Automatic** Time-Temperature and **Humidity Controller.**

Three-ply and Du-o-fold Army Duck Curtains, and Hussey Door Carrier Doors.

Automatic Heating, Ventilating and Humidity Systems for Varnish Rooms.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Sidmans AUTOMATIC **Suction System** for returning ALL Condensation DIRECT to the Boiler.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-Down Draught Vent Heads for all purposes.

Cleanable Screen Panel and Window Ventilators.

Roller Bearing (Ott) **Channel Iron** Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and The Sidman Special Hygrometers.

For Description and prices, write

The

Sidmans of Canada

Heating and Ventilating Engineers and Lumber Curing Specialists

LONDON **ONTARIO**

Thick Birch

Graded By National Inspector

Can be shipped on moment's Notice

5,922 ft. 10/4" 1st & 2nd, Avge. 11"
2,125 " 10/4" Sel & No. 1 Com Avge. 10"
7,773 " 12/4" 1st & 2nd, Avge. 9½"
6,136 " 12 4" Sel & No. 1 Com " 8½"
6,184 " 16 4" 1st. & 2nd. Avge. 9¾"
6,228 " 16 4" Sel. & No. 1 Com. " 10-2 3"

We also offer

2 cars 12 4" No. 1 Com & Btr Hard Maple

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 203 McGill Bldg.

Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

FOR SALE

Planer & Matcher, 24", Double surfacer.
Planer & Matcher, 15", C.M.C. No. 105.
Box Board Matcher, Mereen-Johnson.
Double Surfacer, 30", C.M.C. No. 212.
Single Surfacer, 24", Harper.
Moulder, 12", heavy pattern.
Moulder, 6", sash and door heads.
Shaper, Preston, ball bearing.
Borer, single spindle horizontal.
Band Saws, 30 and 34" Wheels.
Power Feed Rip Saw.
Variety Saw.
Sander, 42", Triple Drum.
Door Clamp.
Nailer, Morgan No. 8 with side arm.

Cowan & Company of Galt Limited
Galt, Canada. 4

USED MACHINERY

For Quick Sale

1—30" Double Surfacer.
1—26" Double Surfacer.
1—24" Double Surfacer.

Above machines equipped with two-knife square cylinders, sectional rolls, flexible chip breakers, countershafts.

Special price for quick sale.

Colladay Machine Works, Manufacturers of Woodworking Machinery, 626 Race St., Philadelphia, Pa. 4

BARGAINS

1 Yates No. 160 Double Surfacer 30 x 6" Rebuilt, as good as new.

1 Woods 30 x 12" Double Surfacer.

1 Woods 30 x 10" Double Surfacer.

1 Cowan 26 x 10" Double Surfacer.

1 MacGregor Gourlay 42" Three Drum Sander Rebuilt as good as new.

Subject to prior sale.

M. E. Casey Co. Limited,
263 St. James St,
Montreal, Que.
Main 411 4

WANTED—Line of medium priced Bed-Room and Dining-Room furniture as side line by two salesmen covering Ontario up to the Soo exclusive Toronto. Both parties dividing Ontario equally. Box 132 Canadian Woodworker, Toronto. 4

WANTED

Woodworking machinery salesman —a business getter. Box 130 Canadian Woodworker, Toronto. 4

WANTED

By manufacturer of Hadwoods, Cypress and Pine Lumber, salesman to cover Canadian territory. State age, previous experience, salary and give full details in first letter. Address Box 128 Canadian Woodworker, Toronto. 4

WANTED

Foreman for machine department of furniture factory in Ontario city. Must have practical knowledge of lumber and woodworking machines and ability to get results in production. Reply, stating age, experience, and salary expected to Box No. 131 Canadian Woodworker, Toronto. 4

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Band Resaw, Connell & Dengler, 54 and 60".
Band Rip Saw, Yates No. 281
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 44 in. heavy type.
Dowel Machine, Hayes
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.
Jointer, Falls Machine Co., undercut 24 in.,
Jointers, 12", 16" and 24"
Jointer, Diehl Continuuous Feed
Lathe, Back Knife Clement 40 in.
Moulder, Hermance 8 and 10 in., 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 4" and 10", 4 side
Matcher, American No. 229 fast feed hardwood flooring.
Planers, all sizes, single and double
Sander, endless bed 48 in., H. B. Smith.
Sander, Moore Machine Co., belt.
Sanders, Columbia 42", 48" and 60"
Saw, mitre, double end Maddox.

Woodworking Machinery Company of Buffalo, 54 Mechanic St., Buffalo, N.Y.
1 T.f.

FOR SALE

Buzz Planer, Clement, 15 in. and C.S.
Buzz Planer, 12 in. and C.S.
Boring Machine, Vertical Rogers, fine order.
Boring Machine, Vertical, R. & R. like new.
Boring Machine, Horiz., Smith 3 spind.
Boring Machine, Andrews, Horiz., 3 spind
Lathe, Wood Turning, 10 in x 48 in., iron bed, C.S.
Moulder, R & H, outside 9 in.
Sander, Rowlingson, belt, disc and drum
Sander, Heath, 30 in., 2 drums, fine,
Sander, Smith, arm or elbow.
Sander, Smith, triple, drum, endless bed.
Saw Table, iron frame, wood top, C.S.
Saw Table, all wood, C.S. attached.
Shaper, Heath, 2 spind., wood top C.S.
Shaper, "Advance" 2 spin. Ball Bearing fine.
Tenoner, Smith, D.H. copes and saw.
Window Frame Machine, Smith & Phillips.

Iron Working Machinery

1—Engine Lathe, 18", 7 ft. bed, screw cutting.
1—Engine Lathe, 13", 5' 4" bed, Screw cutting.
1—20" Drill Press, lever feed.
1—Speed Lathe.

D. E. Rowlingson, Utica, N.Y., P.O. Box 265 4

Woodworking Plant

For Sale or To Rent

Manufacturers in good lake town north of Toronto, making products of wood and iron, are discontinuing the wood lines and their woodworking shop with all or part of the machinery and equipment is for sale at a low rate on the dollar, or for rent at a low rental for a year or two, with option of purchase. Building is a separate unit, modern concrete mill construction, 50 feet by 100 ft. two stories, complete with machinery, 200 h.p. steam plant, belting, shafting, shaving exhaust system, dry kilns, elevators, plumbing electric wiring, two railway sidings, large yard, etc., ready to step into for immediate operation. Hydro-Electic power will be available shortly. Box 129 Canadian Woodworker, Toronto, Ont. 4

Portland Cement in U. S.

Production of Portland cement in the United States in February was 4,278,000 barrels, comparing with 4,291,000 barrels for the preceding month and 4,379,000 barrels in February, 1921, according to United States Geological Survey.

QUALITY SERVICE

In Canadian Hardwoods our aim is to supply you just exactly what you want and at the time you want it.

Any kind, any thickness, any grade

The Kinnon Lumber Co., Limited

454 King Street — — Toronto

NARROW BAND SAWS AND MACHINES FOR THEIR CARE

Our narrow band saws are made of the best Swedish steel and sharpened on the "Grip Feed" Filing Machine the latter of the most advanced design and construction. We specialize in these two items alone, with many years' experience back of us as our qualification to furnish as good a narrow band saw as there is on the market, together with the latest development in a saw-filing machine for the care of band saws.

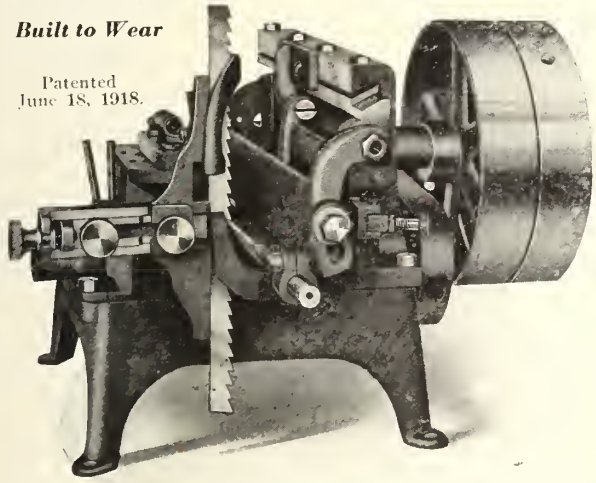
Send us your next order for narrow bands, also ask for particulars of the "Grip Feed" Filing Machine.

American Saw Filing Machine Co.

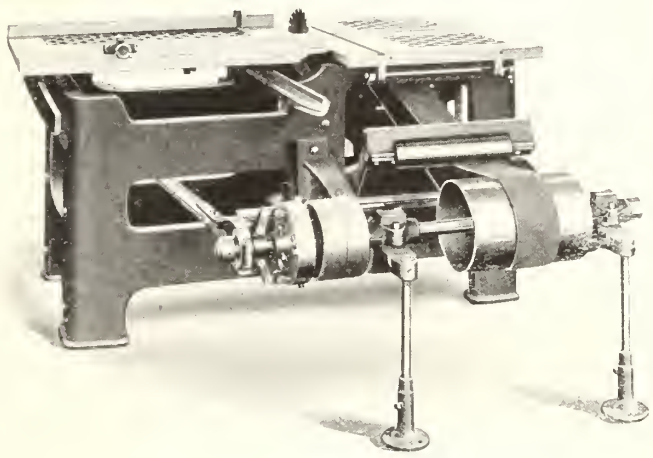
36 Washington St., N. Boston 14, Mass.

Built to Wear

Patented
June 18, 1918.



BEVEL AND MITRE SAW



WOOD-WORKING MACHINES.

No. 19 Small Saw Tenoner. No. 20 Large Saw Tenoner.
No. 21 Regular Bevel and Mitre Saw. No. 22 Large Bevel and Mitre Saw.
No. 23 8½-in. Irregular Dresser No. 24 6-in. Irregular Dresser Stock Clamps.

METAL MACHINES

Large Automatic Power Hammers (For body panels and all other metal work.) Metal Trimming Cutters.
Rotary Cutters.
Small Automatic Power Hammers (For body panels and all other metal work.) Metal Rollers or Formers.
Power Beaders. Foot Presses.

No. 21 Bevel and Mitre Saw

Pettingell Bevel Saw finely suited to work on hard and soft wood for use in automobile, carriage, furniture, sash, door and all wood working factories.

Write for catalogue

PETTINGELL MACHINE COMPANY
AMESBURY - MASS.

The Peter Hay Knife Co., Ltd.

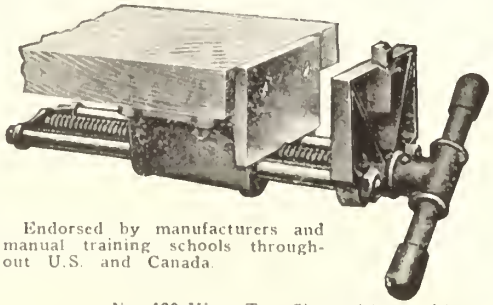
Manufacture the Best

PLANER KNIVES and CUTTERS

OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited
GALT, ONTARIO

Quick as a Cat - A Hold like a Bull Dog

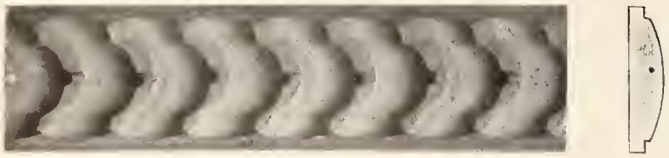


Endorsed by manufacturers and manual training schools throughout U.S. and Canada.

No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

No. 430 Vise—Two Sizes with or without stop
UNEQUALLED FOR STRENGTH AND DURABILITY
Our Complete Catalogue on Request
RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.

CARVED MOULDINGS, CARVINGS, CARVED LEGS



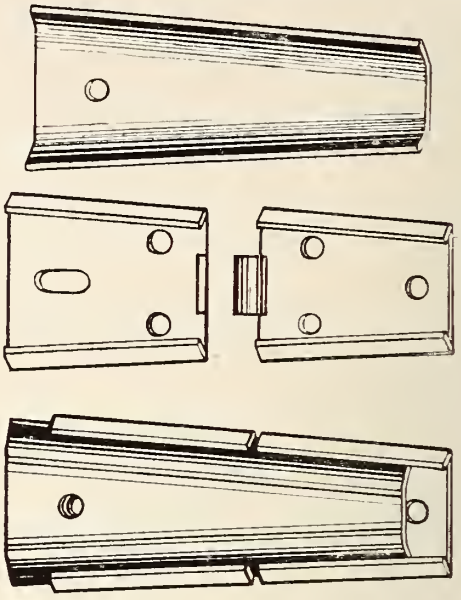
No. D-687 (Reduced One-Half)

No. D-535 (Reduced One-Half)

"KLISE" mouldings are carved, not pressed. Made in several hundred classic, period designs, in various sizes and shapes.

Catalogue of legs and samples of mouldings sent on request. Send us your designs or samples of carvings for quotation.

KLISE MANUFACTURING COMPANY
Grand Rapids, Michigan

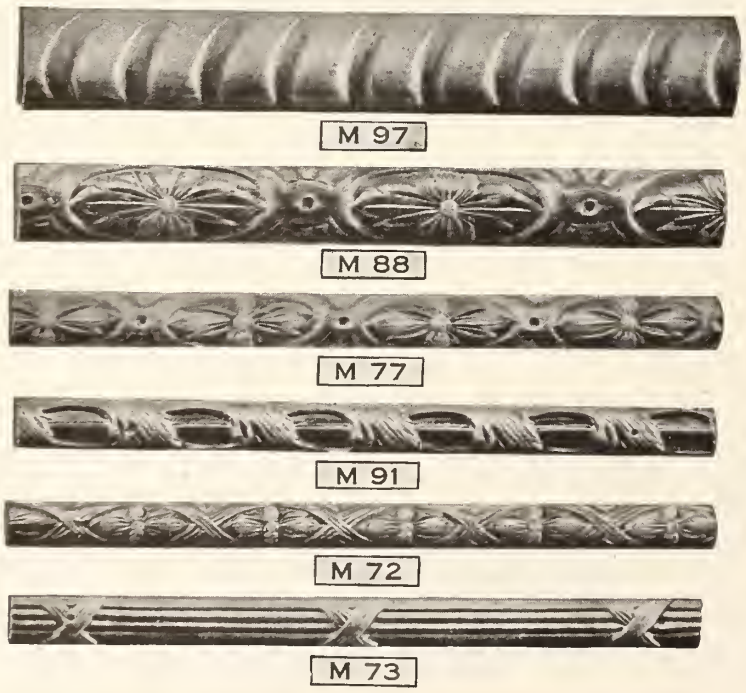


Wedge Toilet Fastener

Furniture Trimmings and Special Hardware

We Also solicit your enquiry for Special Stampings

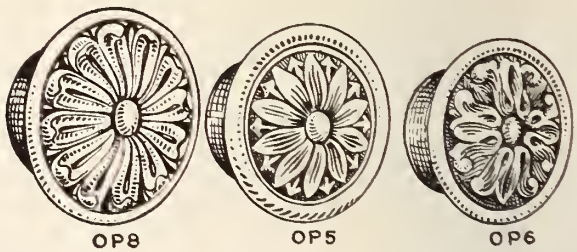
Larsen & Shaw, Limited
Walkerton, Ontario



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.



Waddell Manufacturing Company

Coldbrook and Taylor, N. W. **Grand Rapids, Mich.**

—Motors—

RELIABILITY - KNOWLEDGE - PRICE

Motors—60 Cycle

1—3 H.P. Packard, 3 phase, 220 or 550 volts.
6—1/6 H.P., single phase new.
1—5 H.P. Can. Gen. Electric.
1—7½ H.P. Lincoln, and one 7½ H.P. Fairbanks.
1—10 H.P. Gen. Elec. and Lincoln.
1—20 H.P. General Electric.
1—30 H.P. newly rewound by Swedish General Electric.
4—25 H.P. General Electric.
1—50 H.P. General Electric.
1—75 H.P. General Electric.
1—100 H.P. Westinghouse and General Electric.
Above 5 H.P. motors equipped with regular starters.

Motors—25 Cycle

1—5 H.P. Crocker-Wheeler, 1500 r.p.m., 220 volts.
1—2 H.P. Langdon Davies, 1500 r.p.m., 500 volts. r.p.m.
1—40 H.P. Westinghouse, 720
1—15 H.P. British Gen. Elec.
Other various sizes and new Westinghouse stock all sizes.

Direct Current Motors and Generators
125-250 Volts

1 K.W.
2 K.W. | Westinghouse
3 K.W. | Can. General Elec.
5 K.W. | Lincoln.
10 K.W.
Complete with rheostats and pulleys.

60 Cycle, 3 Phase Generators

60 Cycle, 3 Phase Generators
30 K.W.
50 K.W. 1200 r.p.m. General Elec. and Westinghouse.
75 K.W. Westinghouse.
100 K.W. General Elec., 2300 volts, 900 r.p.m.
300 K.W. Westinghouse, 200 r.p.m.
600 K.W. Electrical Machinery 225 r.p.m.
All complete with exciters and rheostats.

2—175 H.P., 3 cylinder gas, gasoline or crude oil Westinghouse Vertical Engines —250 r.p.m.

Industrial Engineering Company of Canada Ltd.

CONSULTING ENGINEERS - ELECTRICAL EQUIPMENT
R. G. LEE, General Manager
Carlaw Building, Toronto - Royal Bank Building Windsor, Ont.

CLAMP NAILS DO IT

THE CASKET-MAKER

Internationally known and universally adopted by the leading manufacturers of furniture and caskets as the most practical and economical method of mitered joinery.

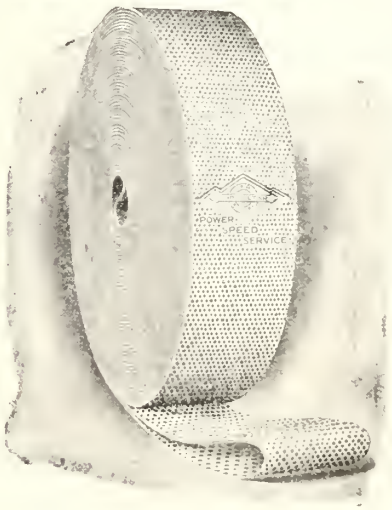
Samples and circulars on request.

CLAMP NAIL COMPANY

4532 Palmer St. CHICAGO, U.S.A.

The "High Efficiency" BELT For the Woodworking Industry

Dunlop "Gibraltar" RedSpecial



A Better Belt for the work.

A Belt adapted to the conditions.

A Belt that will reduce Belting overhead to rock bottom.

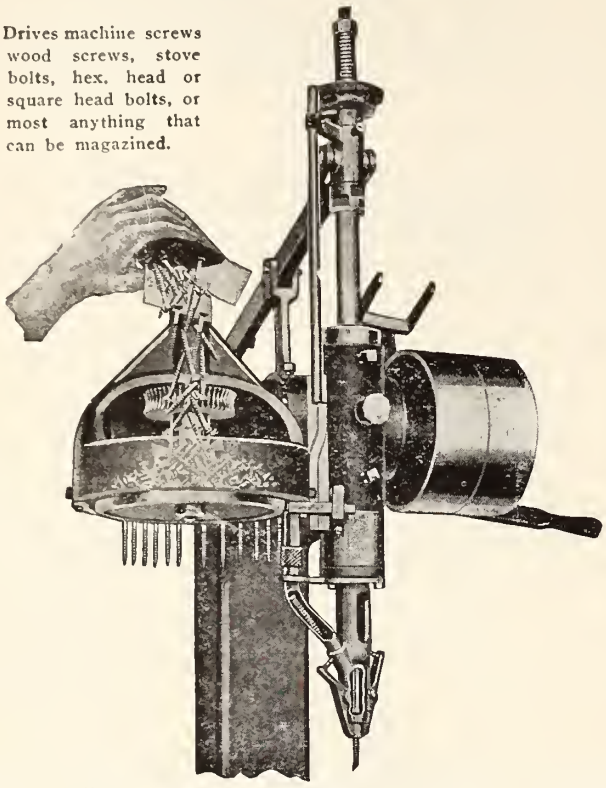
The Dunlop Belt-Service Department will tell you why you can save money by its adoption.

Dunlop Tire & Rubber Goods Co.,
LIMITED

Head Office and Factories: Toronto
Branches in the Leading Cities

The Demand is for Lower Prices!

Drives machine screws wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.



Reynolds Automatic Screw Driving Machinery will help you meet the demand

Everywhere the manufacturer is faced with the problem of price reduction. How can he find the solution?

By cutting out every waste—of time, labor materials, etc.

Many manufacturers have installed Reynolds Screw Driving Machinery for this reason. It accomplishes the work better in one-third of the time.

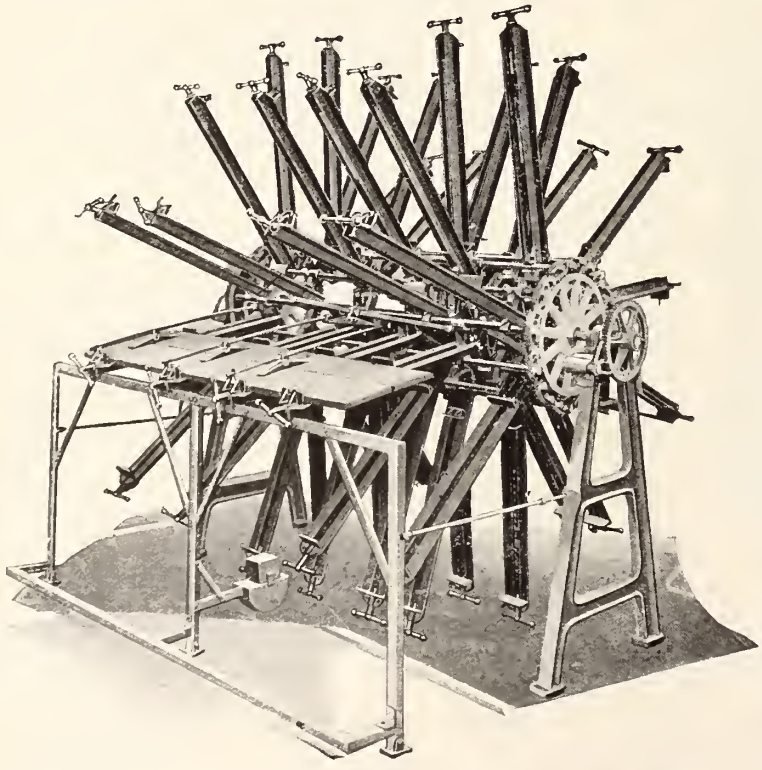
Consequently they are able to meet the demand for lower prices and hasten the return to normal buying.

Are you interested? Then write us to-day for the full facts.

Send us dimensions over all of your work and gauge and length of screws driven so that we can determine the proper size and type machine to meet your requirements.

The Reynolds Machine Co.
Department C.
Massillon, Ohio, U.S.A.

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK

CLAMP CARRIER

for

Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.

HYDRAULIC VENEER PRESSES
AND
LUMBER ELEVATORS

Write for Explanation of our Most Efficient Veneer Package Handling System

E. B. VAN ATTA & CO., INC.
OLEAN, N. Y.

New York City Office: 50 Church St. Chicago Representative: Fader Machinery Company, 549 Washington Boulevard

"Established 1884"

GUELPH PATENT CASK CO. Ltd.
Scotstown, Que.

QUALITY *SERVICE*

Our Veneers and Plywood are choice and we are fully equipped to supply the Canadian Trade.

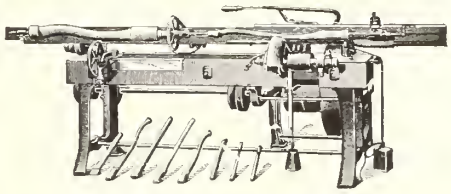
Rotary cut Textile dried

We specialize in 1/4" and 3/16" three ply Birch Panels

Ontario Representative:
Frank Moss P. O. Box 356, **Toronto**

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.
We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY
Klotz Machine Co.,
Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

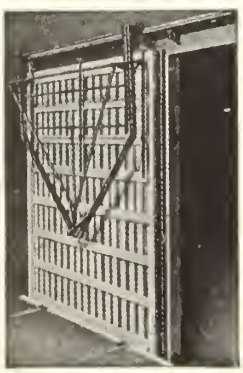
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A

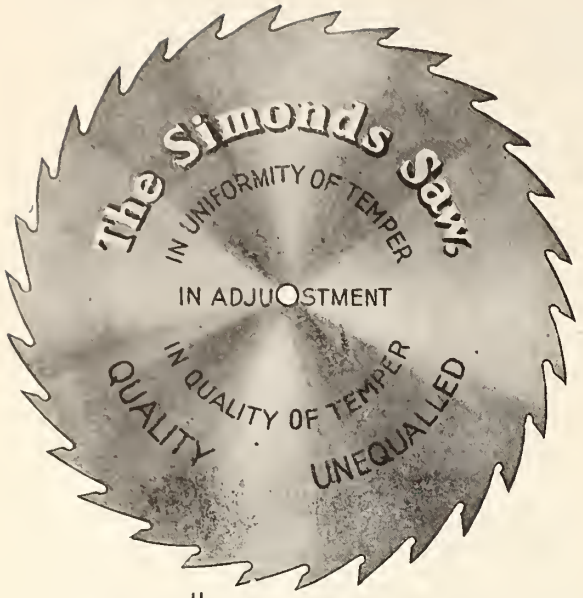
The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.
Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.



SIMONDS
CIRCULAR AND BAND
SAWS

In every mill or woodworking shop in the land the demand for greater production is urgent. Devious methods to secure the desired results are being tried out. Some are making good—some are not. They have the manpower, but they can't get production. Many mills and woodworking shops have discovered one of the greatest hindrances to efficient operation are poor saws and knives. The saws dull easily and do not hold their tension, while the knives lose their cutting-edge quickly and this results in unsightly marks on the lumber, and consequently damage.

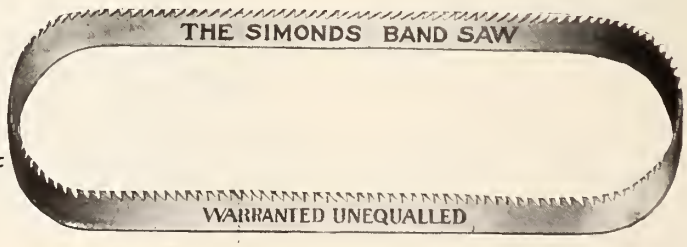
Inferior saws and knives are being discarded by many, and in most cases Simonds Products are replacing them. There is no question about Simonds Saws and Knives They are made of the finest steel obtainable, hardened and tempered right and make mechanically perfect. They produce smooth lumber and cut down your operating expense.

Write for catalog and prices.

Simonds Canada Saw Co., Limited

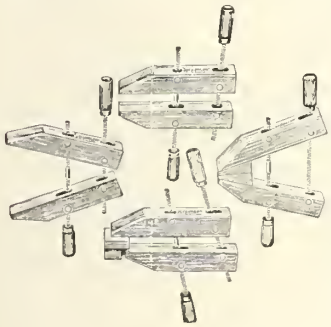
"The Saw Makers"

MONTREAL, Que.
VANCOUVER, B.C. ST. JOHN, N.B



"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.



"Jorgensen"

Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

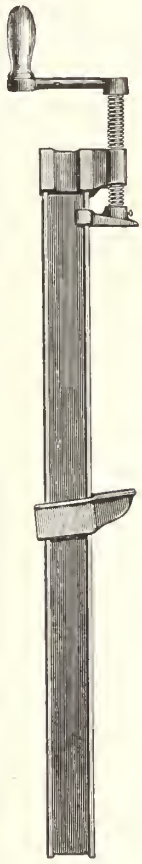
For Sale By

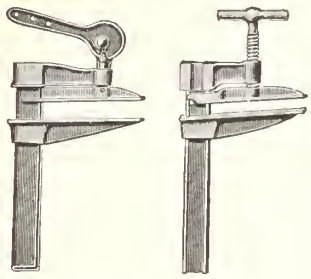
Aikenhead Hardware Limited ..... Toronto
Caverhill Learmont Co. ..... Montreal
Lewis Bros., Limited ..... Montreal

Colt's Clamps

for the

Woodworker





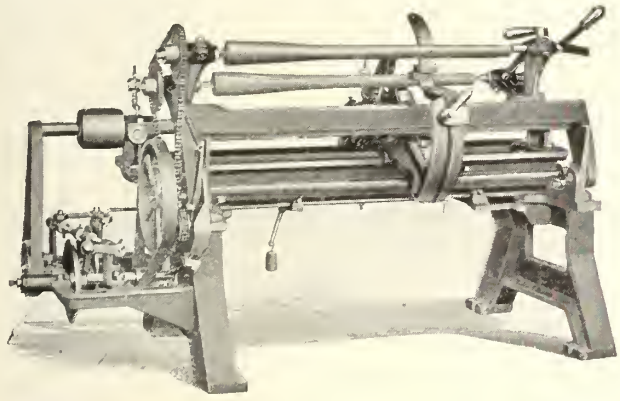
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



Wood Turning Machinery

for making Handles, Spokes, Ball-Bats, Spindles, Table Legs, Chair Legs, Whiffletrees, Neck Yokes, Etc.

ALSO SANDERS, RIP SAWS, CUT OFF SAWS, ETC.

Our machines are
SIMPLE, STRONG, DURABLE

Write for free catalogue No. 31

THE OBER MFG. CO.

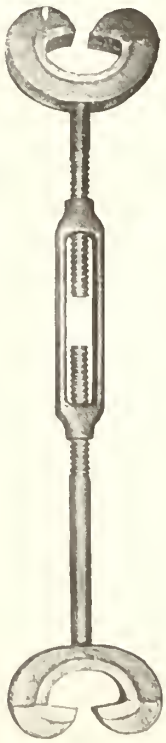
CHAGRIN FALLS, O., U.S.A.

Better work follows the use of the "Empire"

There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

Get in touch with us now. We can make prompt delivery from stock.

We specialize in all types of woodworking tools.



Empire Tool Works

Toronto - Ontario

The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Co., Chicago, Ill.

AROMATIC RED CEDAR
Earthman Lumber Co., Murfreesboro, Tenn.

AUTOMATIC HOLE-CUTTING MACHINE
Virginia Wheel and Hole Sawing Machine Co., Roanoke, Va.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARINGS
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P.B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

B. C. FOREST PRODUCTS
B. C. Lumber Commissioner, Toronto, Ont.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner Mass.
Williams Machinery Co., A. R., Toronto, Ont.

BEVEL & MITRE SAWS
Pettingell Machine Co. Amesbury, Mass.

BLOWERS
Canadian Blower & Forge Co., Kitchener, Ont.

BLOW PIPING
Canadian Blower & Forge Co., Kitchener, Ont.
Neville Cooper Co., Toronto.

BOILERS
Engineering & Machine Works, St. Catharines, Ont.

BORING MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Son Co., L. G., Gardner, Mass.
Nash, J. M., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Reynolds Machine Co., Massillon, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Valley City Machine, Works, Grand Rapids, Mich.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.
Cary Mfg. Co., Brooklyn, N.Y.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

BUTTONS
Rowe Mfg. Co., Newaygo, Mich.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CARVINGS
Klise Mfg. Co., Grand Rapids, Mich.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.

CARVED WOOD MOULDINGS
Klise Mfg. Co., Grand Rapids, Mich.

CASTERS
Foster, Merriam Co., Merriden, Conn.
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Shurly-Dietrich, Galt, Ont.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Bell Machine Co. Oshkosh, Wis.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company, Preston, Ont.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

CLAMP CARRIERS
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.

CRATING LUMBER
Lloyd, W. Y., Toronto, Ont.
Colborn, C. B., Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D., Guelph, Ont.

CUT-OFF SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind
Richards-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

DOWEL MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Williams Machinery Co., A. R., Toronto, Ont
W. S. Hawker Mfg. Co., Dayton, Ohio.

DOWELS
Canada Wood Specialty Co., Ltd., Orillia, Ont
Rowe Mfg. Co., Newaygo, Mich.

DRIERS(Hot Plate)
Merritt Eng & Sales Co., Lockport, N.Y.

DRIERS (Veneer)
Merritt Eng & Sales Co., Lockport, N.Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont
Grand Rapids Veneer Works, Grand Rapids Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.
Simonds Canada Saw Co. Montreal, P.Q.

EDGER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont
Garlock Machinery Ltd., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.

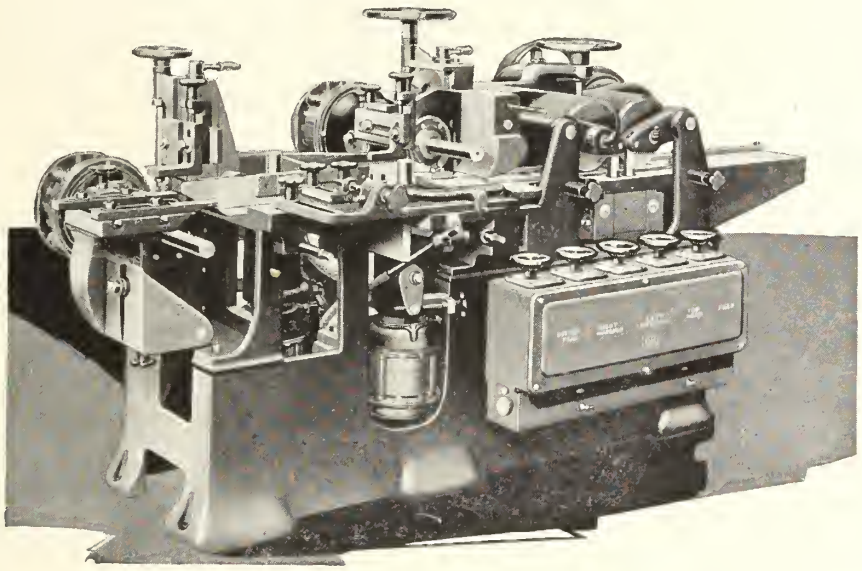
FEED ROLLS
Atkins & Co., E. C., Hamilton, Ont.

FINISHING PRODUCTS
Campbell Co., M. L., Kansas City, Mo.
Flint Varnish & Color Works, Toronto, Ont.

FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

SKF



Perfect Spindle Alignment at High Speed

One of the greatest of moulder troubles is pounding and whipping of belts travelling at a speed of more than a mile a minute. On the above machine such troubles are entirely eliminated by substituting individual motor drive in place of belts and **SKF** marked self-aligning ball bearings in place of ordinary babbitt bearings. This combination eliminates the pound and slap which quickly destroy ordinary bearings; it provides also bearings which automatically compensate for any possible misalignment or deflection in the spindles.

SKF marked self-aligning ball bearings in any kind of woodworking machinery minimize friction and wear; they decrease vibration and keep moving parts in proper relation to each other, thereby insuring greater production and a better quality of work.

CANADIAN SKF COMPANY, LIMITED

TORONTO and MONTREAL

715

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

FASTENERS
Cary Mfg. Co., Brooklyn, N. Y.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GEARS
Hamilton Gear & Machine Co., Toronto, Ont.

GLUE
Coignet Chemical Products Co., New York N.Y.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
Aberdeen Lumber Co., Pittsburg, Pa.
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Rush Lumber Co., Memphis, Tenn.
Thomas & Proetz Lumber Co., St. Louis Mo.
Turner-Farber-Love Lumber Co., Leland, Miss.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.

HARDWOOD DIMENSION STOCKS
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson-Tully Co., Memphis, Tenn.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Dudley Lumber Co. Inc., Memphis, Tenn.
Farrin Lumber Co. M. B., Cincinnati, Ohio.
Frye Lumber & Veneer Co., J. W., Dayton, O.
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co,, New Orleans, La
Hafner Manufacturing Co., St. Louis, Mo.
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co. Toronto, Ont.
Kinnon Lumber Co., Ltd., Toronto, Ont.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont
Pickrel Walnut Co., St. Louis, Mo.
Richards Hardwood Co., Memphis, Tenn.
Rush Lumber Co., Memphis, Tenn.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn
Stimson & Co., J. V., Owensboro, Ky.
Sullivan, Frank T. Buffalo, N.Y.
Tennessee Lumber & Coal Co., Cincinnati Ohio.
Thomas & Proetz Lumber Co., St. Louis Mo.
Turner-Faber-Love Lumber Co., Leland, Miss.
Vail Cooperage Co., Fort Wayne, Ind.
Whiting Co., Wm. S., Johnson City, Tenn.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.
Van Atta & Co., E. B.., Olean, N. Y.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company. Kitchener. Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.
Yates Machine Co., P.B. Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PANELS
Algoma Panel Co., Algoma, Wis.
Calhoun Plywood Co., Sheboygan, Wis.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

LOOK IN THE SCRAP BOX

THERE is much to be learned by looking in the scrap box in any sanding room.

If it is filled with half worn paper or cloth that has dulled too quickly—if it is loaded with scrapped, partly-used belts or paper that has split and peeled long before doing full duty on the machines—then your scrap box is telling you a story of excessive waste—a story of soaring sanding costs.

Carborundum Brand Garnet Paper and Cloth Products because of the unquestioned strength and flexibility of backing—because they are uniformly coated with clean, hard, sharp, North River Garnet—because they hold their grain and produce more work reduce such waste to a minimum.

CARBORUNDUM BRAND GARNET PRODUCTS
MAKE GOOD SANDERS BETTER SANDERS

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y. U.S.A.

New York, Chicago, Boston, Philadelphia, Cleveland, Detroit, Cincinnati, Pittsburgh, Milwaukee, Grand Rapids

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co.. P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Calhoun Plywood Co., Sheboygan, Wis.
Guelph Patent Cask Co. Scotstown, P.Q.
Wisconsin Veneer Co., Rhinelander, Wis.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Klise Mfg. Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co., Herman, Brooklyn, N.Y.

SASH, DOOR & BLIND MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SATINWOOD
Willey Co. C. L. Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P.B. Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont
Simonds Canada Saw Co. Montreal, P.Q.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D. Guelph, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW TENONERS
Pettingell Machine Co. Amesbury, Mass.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock Machinery Ltd., Toronto, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dictrich, Galt, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW FILING MACHINERY
American Saw Filing Machine Co. Boston, Mass.

SAW TENONERS
Pettingell Machine Co. Amesburp, Mass.

STEEL DOOR MATS
Cary Mfg. Co. Brooklyn, N. Y.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont

TABLE SLIDES
Bruce Woodworkers Ltd. Chesley, Ont.
Walter & Company. B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.

TRIMMERS
Arhuthnot Lumber Sash & Door Co., Vancouver, B.C.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind
Oliver Machinery Co., Grand Rapids, Mich.
Shantz, P E., Preston, Ont.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Klise Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.
Walter & Sons, J. Kitchener, Ont.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

TWIST WORK
Klise Mfg. Co., Grand Rapids, Mich.

OVERTON K.D. BENCH

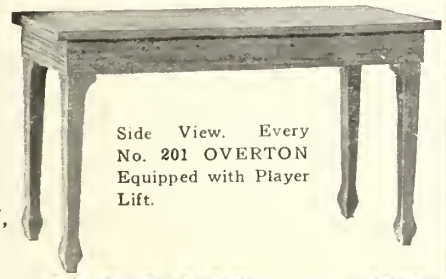
No. 201

A high grade popular priced bench which is shipped K.D. only, is easily set up, and permanently rigid.

The 4 legs are shipped carefully packed in music compartment. A saving of one-quarter in size of package; 15 pounds in weight; and about 30% in freight; with no danger of damage in transit.

Assembled in less than two minutes with a screw driver. Our patented corner bolt construction makes a solidly rigid bench.

Beautifully finished to match the finest instrument. Write for our new catalog and color chart.



Side View. Every No. 201 OVERTON Equipped with Player Lift.

S. E. OVERTON Company

SOUTH HAVEN, Michigan, U.S.A.

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY

17 State Street NEW YORK CITY

A Small List Taken From Our Stock of New and Used

Woodworking Machinery

No. 551 C.M.C. chain saw mortiser.
30" Boss double surface planer and matcher.
24" Cowan planer and matcher.
28" Whitney pattern surfacer.
12" Petrie special pattern buzz planers.
Fay horizontal single spindle boring machine.
Jackson-Cochrane horizontal, 5-spindle boring machine.
48" Berlin three-drum sander.
30" Boss double drum sander.
60" Fay & Egan band re-saw.
54" McDonough, horizontal, band re-saw.
42" West Side, power feed, rip band saw.
Humphrey clothes pin lathes and slotters.
American variety woodworker.
Elliot universal motor driven woodworker.

Ask for our complete stock list

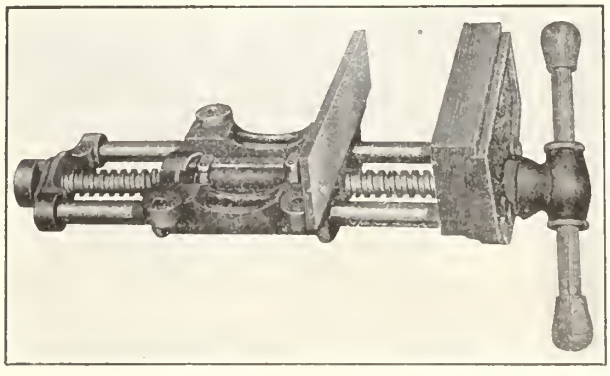
Machinery--Transmission Equipment--Small Tools

H. W. Petrie, Limited

131—147 Front Street West

Toronto

The Vise You Swear BY not AT



On the Market for 15 years.

Globe Vise & Truck Co.

GRAND RAPIDS, MICH.

We also manufacture a complete line of steel trucks particularly for wood working factories. The body of our truck is absolutely indestructible, and there are no nails nor screws in the top to mar material, whether finished or unfinished. The roller bearing feature in the wheels allows for much easier handling than the old style plain wheels on the wood truck. In fact one man can handle much more material than on the old style. The price is very little more than that of the old style wood trucks.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Ault & Wiborg Company, Toronto. Ont.
Flint Varnish & Color Works, Toronto, Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind
Frye Lumber & Veneer Co., J. W., Dayton, O.
Guelph Patent Cask Co. Scotstown, P.Q.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Wisconsin Veneer Co., Rhinelander, Wis.
Wood Mosaic Co., Louisville, Ky.
Willey Co. C. L. Chicago, Ill.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.
Van Atta & Co., E. B., Olean, N. Y.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids. Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.
Sullivan, Frank T. Buffalo, N.Y.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.
Flint Varnish & Color Works, Toronto, Ont.

WOODWORKING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Elliot Machinery Co. Belleville, Ont.
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids Mich.
Pettingell Machine Co. Amesbury, Mass.

WOOD TURNING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Elliott Machinery Co., Belleville, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids. Mich
Yates Machine Co., P.B. Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids. Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids. Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

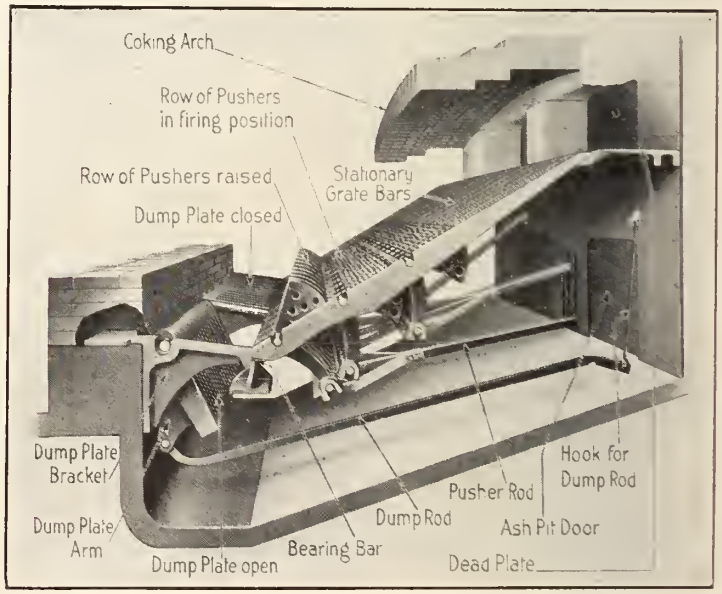
WIRE BOX STRAPPING
Cary Mfg. Co. Brooklyn, N. Y.

Efficient, economical, smokeless Firing—

The burning of refuse is an old story with woodworking establishments but the awakening to the possibilities of improved systems of using this new valuable fuel through the

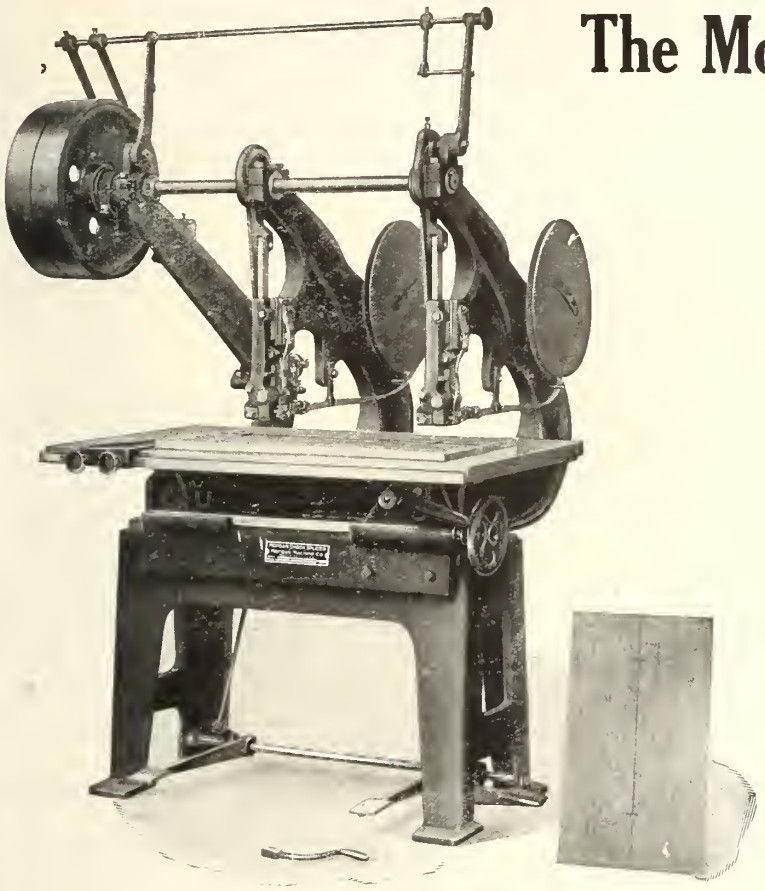
NATIONAL
Hand Fired Stokers

is something new. It offers semi-automatic stoking which gives results with cheap help that an experienced fireman can only get—sometimes. Better boiler capacity and thorough combustion of any type of fuel is ensured. Let us send you full particulars.



Engineering and Machine Works of Canada, Limited
St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal

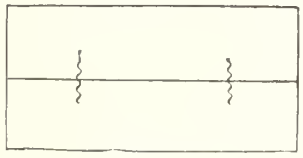


The Morgan Shook Splicer

uses narrow stock

It automatically feeds, cuts and drives corrugated fasteners. Adjustable—handles fasteners from 1/4″ to 7/8″ in width and from 3/4″ to 1 1/4″ in length.

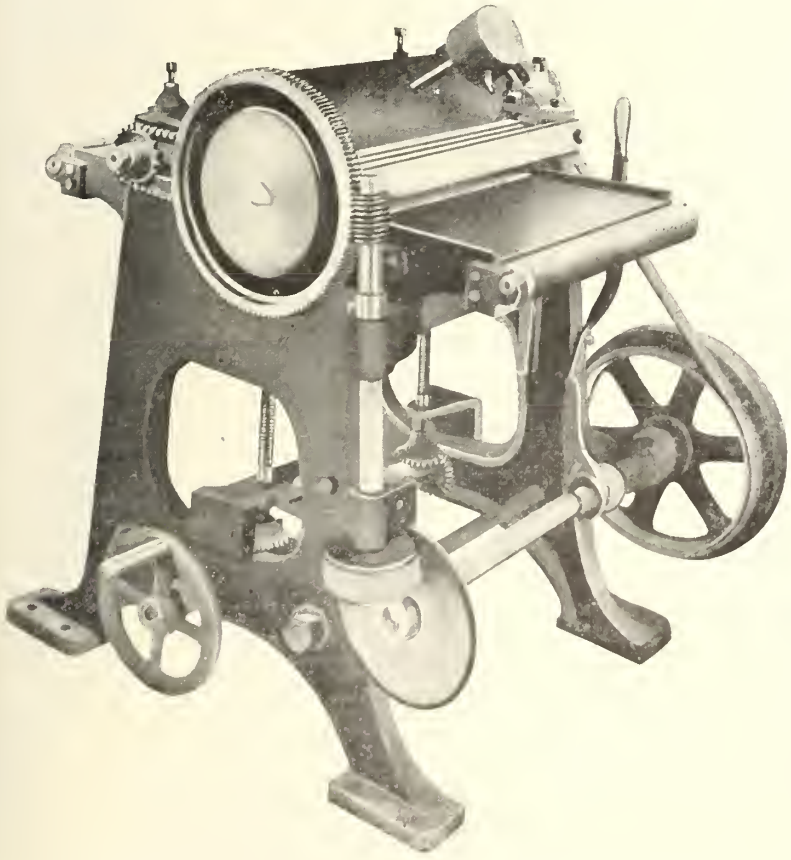
Speed, Accuracy, Economy



We manufacture Matchers, Printers and Nailing Machines.

WE INVITE YOUR INQUIRY

Morgan Machine Co.
Rochester, N. Y.



The Elliot Bull Dog Planer

6″ x 16″

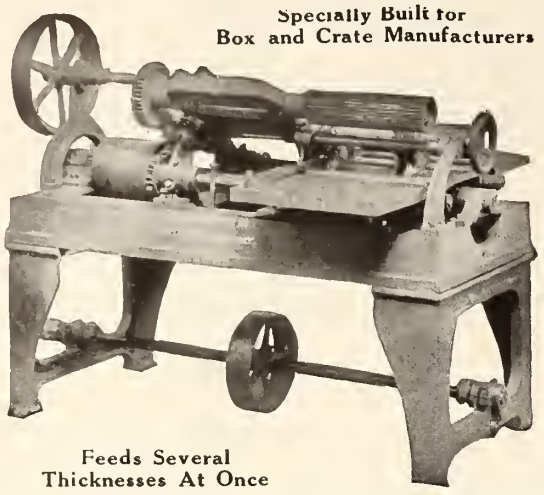
The facts that the head is run by a worm gear; no pinions on the head and that the feed rolls are driven independent of the head excludes vibration. Hence—it planes smoother than any other Pony Planer made. Also it uses less power.

Write for Prices and Catalogue

Elliot Machinery Co.
Limited
Belleville, - - - Ontario
CANADA

"The Chattanooga" — Just Another Name For Fast, Economical Gang Ripsawing

Specially Built for Box and Crate Manufacturers



Feeds Several Thicknesses At Once

This latest improved gang ripsaw is powerful, fast, safe and eliminates wastage. For gang sawing boards into strips or head sticks and for ripping veneers it is unsurpassed.

Has powerful feed and securely holds down and feeds short pieces. The feed rolls are automatically adjustable to varying thicknesses. Upper rolls are driven by cut gears, and the lower ones by sprocket chain. Several thicknesses of veneering can be fed thru machine at one time.

The CHATTANOOGA is an unusually big producer, easily operated, and turns to profitable account short stuff lying around a mill—otherwise wasted.

Attractive price. Complete information on request

Chattanooga Machinery Company
Chattanooga, Tenn.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.

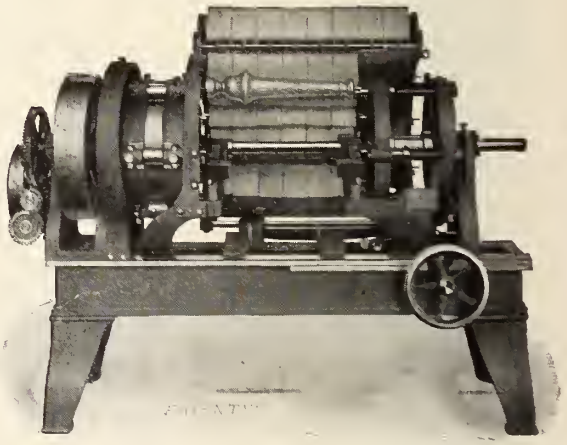
To **Woodworkers and Furniture Manufacturers**

Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

We are always pleased to quote prices and give any information you may desire. Try us on your next order.

THE
Brantford Pattern Works
BRANTFORD

YOU WOULD NOT HESITATE



to put in an Automatic Lathe for your furniture turnings if your output requires it. Then why hesitate about installing a Nash Sander for such work. The hand sanding operation is most expensive and unsatisfactory. Much better work can be done on the Sander at greatly reduced cost.

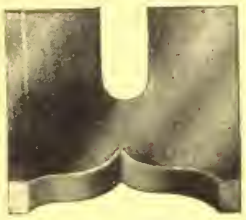
J. M. NASH, Milwaukee, Wis.

ATKINS

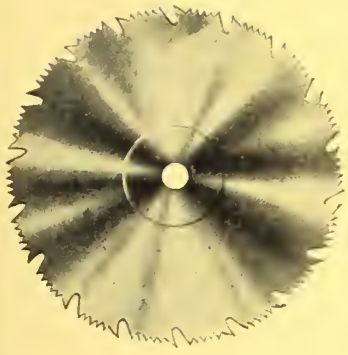
STERLING QUALITY

SAWS and KNIVES

ECONOMIZE



ARE your saws and knives wasting your lumber? If so, why not turn that waste into a profit by installing

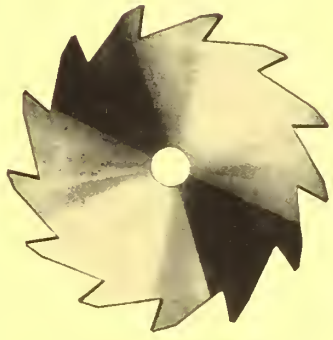


Atkins Sterling Quality Saws

and Machine Knives

Some of the largest woodworking mills in the country are using Atkins Saws exclusively, because they increase production, stop waste and make a name for themselves wherever they go.

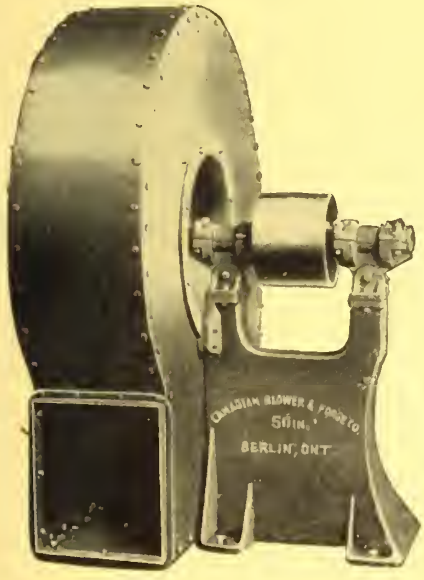
Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.



E.C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**



Canadian Planing Mill Exhauster

Keep your shop clean, remove your sawdust, shavings, or other loose material.

A clean shop with machines free from shavings, chips or sawdust makes for greater efficiency.

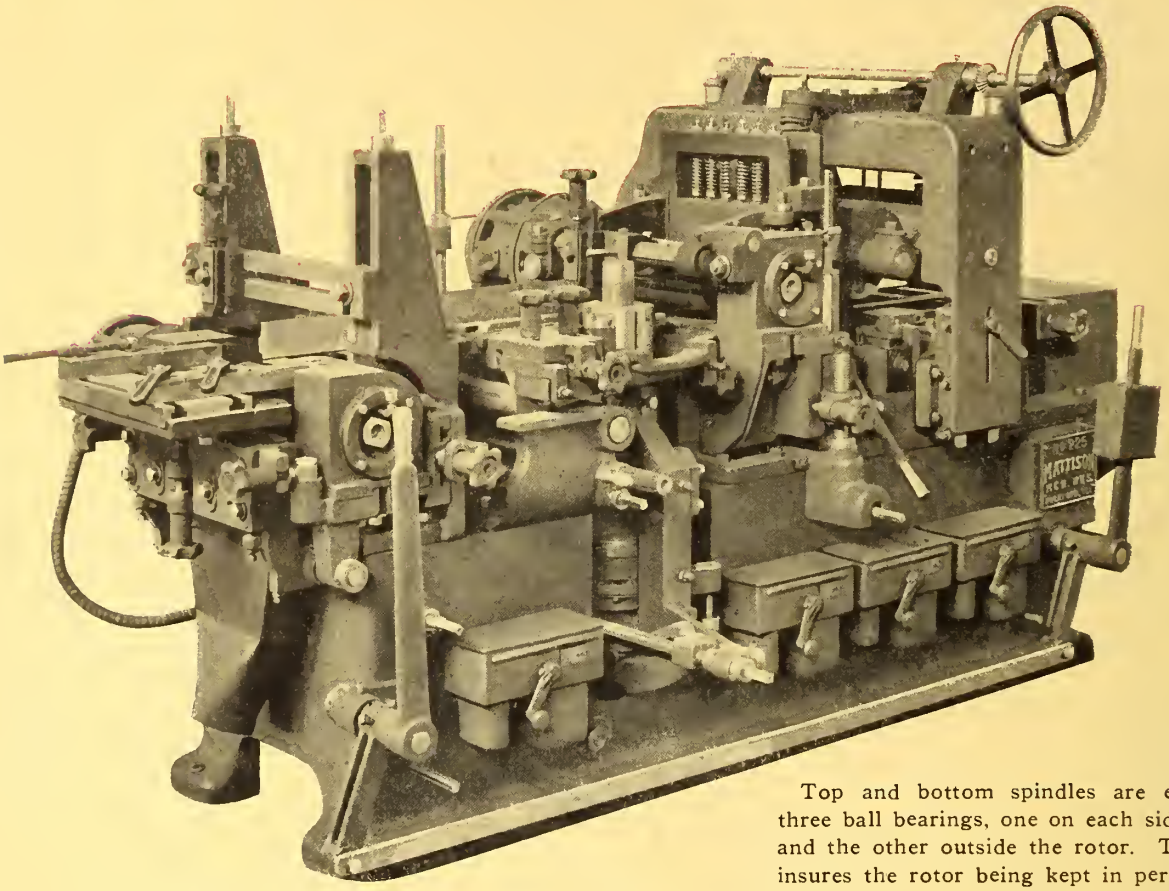
Let our engineering department help you plan your refuse exhaust system.

Write for Catalogue 400-13

Canadian Blower & Forge Co.

KITCHENER, ONT.

Production Demands the Electric Moulder



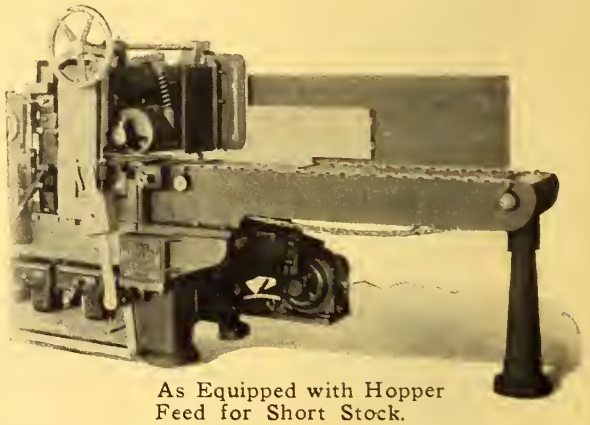
Top and bottom spindles are each provided with three ball bearings, one on each side of the cutterhead and the other outside the rotor. This outside bearing insures the rotor being kept in perfect alignment with inside walls of field coils.

TEN years ago, when a man bought the latest and most efficient type of moulder, it was a belt-driven machine. Yet, it was the best he could get.

But today, even if he selects the most efficient and up-to-date type of belt-driven moulder, he is still getting a machine that is already out-of-date. For the advent of the Motor-Driven Moulder marks the opening of a new era in moulder construction; and from now on the motor-driven type will, without a doubt, gradually replace the belt-driven moulder in all modern plants.

The Mattison Electric Moulder, with its powerful, individually controlled motors for each head and the feed works; with its removable outside bearing, and accessibility for quick set-ups, marks a wonderful advancement in moulder construction.

Ask us to send our Illustrated Bulletin Explaining Construction



As Equipped with Hopper Feed for Short Stock.

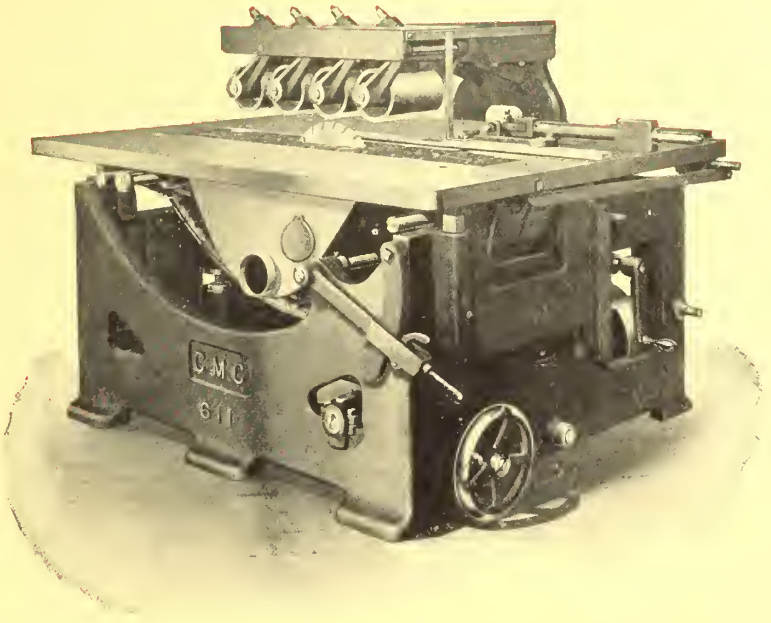
MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.

olume Twenty-Two TORONTO, MAY, 1922 Number Five

CANADIAN WOODWORKER and Furniture Manufacturer

C.M.C.

No. 611 Straight Edging
and
Jointing Saw
with
Ball Bearings
and
Sectional Rolls



When we put our No. 611 Straight Edging and Ripping saw on the market. we gave the woodworking trade the best machine of this type which had been offered them, and it is generally recognized that the "611" is still without an equal.

It has been suggested to us by some users that this machine might be improved by using sectional feed rolls for feeding uneven stock, and equipping it with ball bearings to reduce power consumption. We are pleased, therefore, to draw the attention of our many friends to our No. 611 Straight Edging and Jointing Saw with these latest improvements.

Full details on request

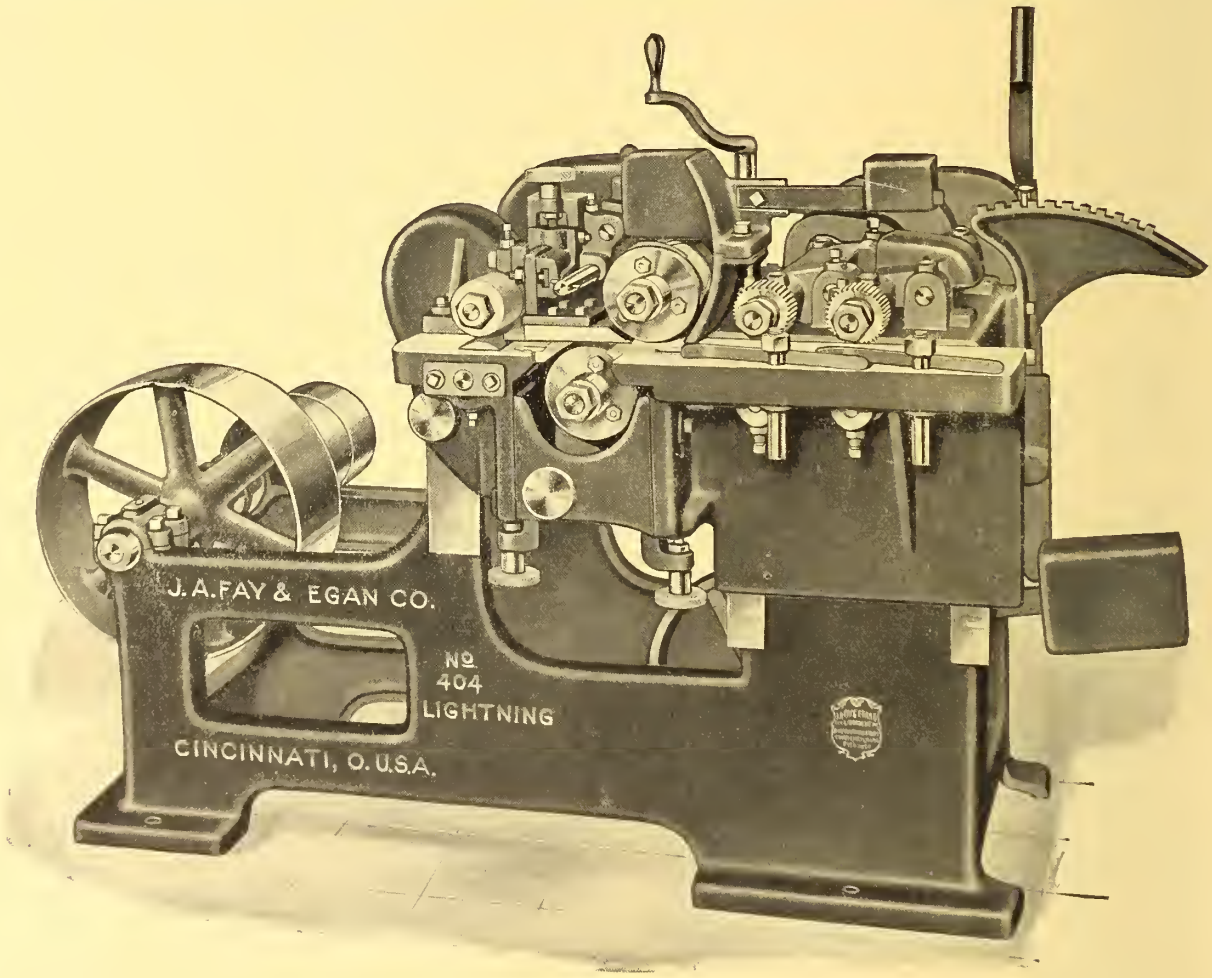
CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721 Bank of Hamilton Building

Alphabetical Index to Advertisers, Page 12

Dowels
Skewers
Blind Slats
Flag Sticks
Lead Pencils
Curtain Sticks
Splines for Cane Chairs

—are a few of the many kinds of sticking work performed on—



No. 404 Pencil, Skewer, and Dowel Machine

J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St. - - Cincinnati, Ohio, U. S. A.

Exclusive Agents for the Dominion: A. R. Williams Machinery Company, Ltd., Toronto, Ont.
Branches: Montreal, St. John, N. B., Winnipeg, Vancouver

Another "Made In Canada" Product

Re-Drier for Veneers

A most essential and money saving-machine for your Veneer Room.

We can show you this machine in operation—also under construction. Let us give you full particulars for your plant requirements.

A few more machines in our stock in addition to those advertised last month:—

54" McGregor Gourlay Band Re-Saw.

24" Jointer Herzog Power Feed Attachment

Monarch 36 x 72 Hydraulic Veneer Press, pump, trucks, retainer rods complete.

McGregor Gourlay Double End Tenoning Machine, Copes cut off saws.

Surfacers Single and Double for Cabinet Shop and Box Factory.

Cross cut saws.

Rip saws.

Railway cut off saws.

Fast Feed 15" Planer and Matchers with and without Feeding Tables.

And many other machines for Sash and Door, Cabinet, Box Factory, and Planing Mill work. All in A1 shape and all subject to prior sale.

Send us your Inquiries

Garlock Machinery Limited

163 Dufferin Street

WINNIPEG - TORONTO - MONTREAL

Everything in Woodworking and Metal Working Machinery

Quiet Gears

Why Tolerate Noise?

Use our efficient and durable Celeron or Rawhide Pinions

Gear Data for Your Note Book

Cut This Out—More Coming Later

SILENT PINIONS

From The Hamilton Gear & Machine Co., Toronto

NON-METALLIC PINIONS should be used wherever noisy gears would be objectionable. When well made they are really quiet. They have about the same strength as cast iron at slow speeds, and at high speeds they will carry more load than cast iron on account of their elasticity and smooth running. Rawhide will not stand oil or water. For such service use a pinion made in the same manner, but with CELERON instead of hide.

For best service and quietness make the face wide enough so that the metal mate does not touch the flanges of the pinion. When used on a motor add to the face the amount of the end play on the motor. Do not drive rawhide pinions by a set screw in one hub. Use preferably a key to distribute the load to both flanges and put less strain on the rivets. Flanges should always be made the full outside diameter of the pinion. Red brass is the most suitable material.

We carry a good stock of both celeron and rawhide of superior quality and can make very quick delivery on pinions, especially standard styles without hubs.

Remember—Our Non-Metallic Pinions are Quiet and Serviceable. We make the best quality and quickest delivery.

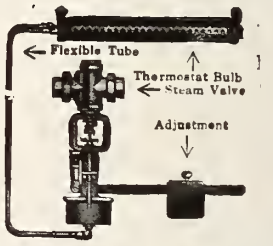
Write for Quotations

Hamilton Gear & Machine Co.

76 Van Horne St. TORONTO

You Don't Guess Time! Why Guess Temperature?

In the glue kettle, the varnish drying room, the dry kiln—wherever there is a need for maintaining a definite, even temperature, the Powers Automatic Heat regulators give "100 per cent perfect" results. They are always on the job—accurate, sure, reliable. They prevent overheated glue, checked or case-hardened lumber, crazed varnish—all the errors that are so apt to creep in with manual control.



The Powers Regulator No. 15

Entirely self-contained. Peculiarly adapted for control of drying room, kiln, etc.
Other Powers Regulators for other places. Ask for details.

We shall be glad to give you the benefit of our more than thirty years experience in temperature regulation, and if you will tell us where you would like to try out a Powers Regulator, we will send the right one for thirty days' trial. If you don't find it satisfactory, send it back.

The Canadian POWERS REGULATOR Co Ltd
Specialists in Automatic Heat Control
82 CHESTNUT ST., TORONTO ONT.

(1079D)

Do you know that we make the smaller woodworking machines as well as the big ones?

We're not going to tell you about any particular machine, we want to have a little talk with you.

Are you one of those fellows when thinking of woodworking machines, say to yourself, there's Yates in Hamilton, but their machines are too big for me, I only want a small machine.

Get that idea out of your head about us building the big machines only, we certainly do and sell lots of them, but, we also build the smaller ones, and they are certainly built good too, any user of our machines will tell you so.

The next time you are thinking of making additions or changes in your plant, and you want information on any kind of woodworking machines, keep us in mind drop us a line, we'll gladly give you the benefit of any information we may have.

Yours very truly.

P. B. YATES MACHINE CO. LIMITED

YATES

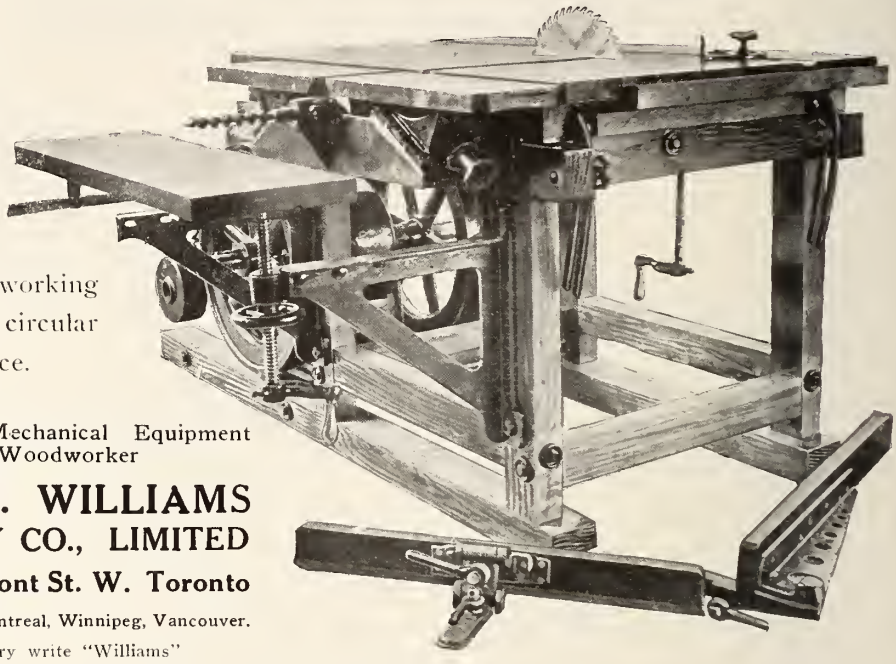
WOODWORKING MACHINERY

Hamilton-Canada

Let This Machine Earn Money for You

BEACH SAW TABLE

Comprising Rip and Cross-Cut Saw, Table, 6" Jointer, Boring Attachment. On extended skids for either motor or gasoline engine drive. Ideal for contractor or construction company for use right on the job, as well as being a real boon in any woodworking shop. Write us for illustrated circular giving full specifications and price.



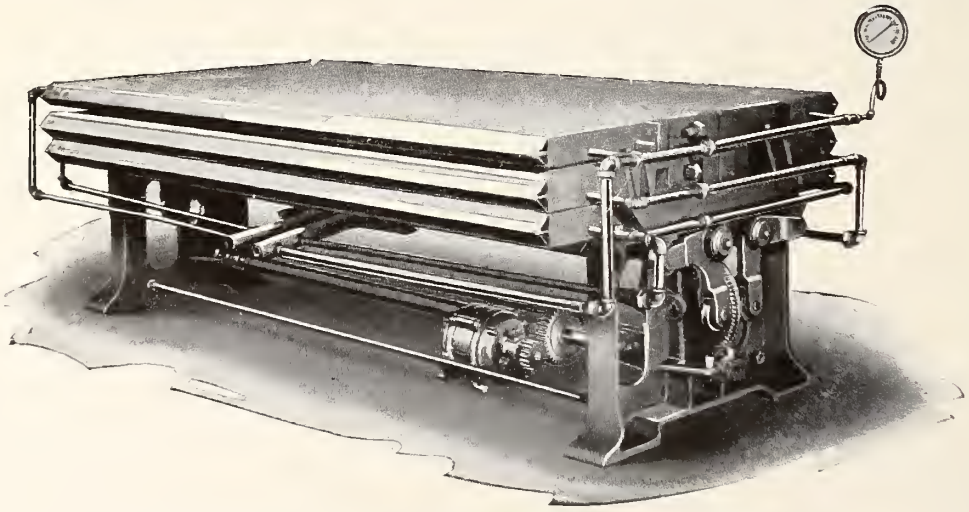
Everything in Mechanical Equipment for the Woodworker

THE A. R. WILLIAMS MACHINERY CO., LIMITED

Dept. T.C. 20 Front St. W. Toronto

Halifax, St. John, Montreal, Winnipeg, Vancouver.

If it's machinery write "Williams"



The "Merit" Three-Plate Veneer Re-Drier

has two openings only and is designed for plants having need of a re-drier of moderate cost and of limited capacity.

The machine is electrically driven and is piped for connection with the factory steam line.

A vertical movement of the middle plate gives the veneer pressure first in one opening and then in the other and provides the well-kown "Breathing Movement" peculiar to Merit Re-Driers.

MERRITT ENGINEERING & SALES COMPANY
Lockport, N. Y.

MESCO

The "Merit"
Re-Drier
FOR VENEER

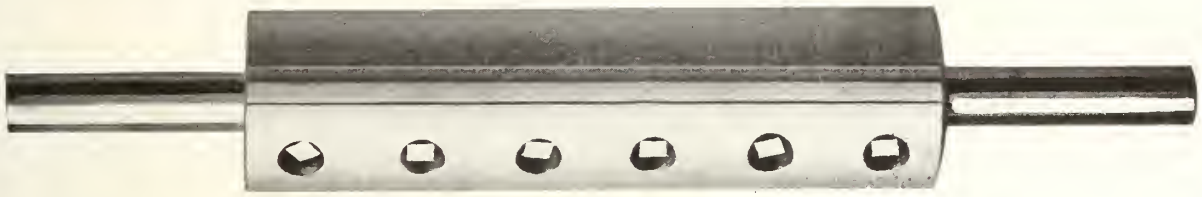
INSURE your veneer work against surface checks, hair lines, blisters, warping and glue failure by installing a "Merit" Re-drier.

Thoroughly dry and flat veneer avoids these troubles, gives tight joints and saves glue.

No system of air drying will accomplish this result. Hot Plates with "breathing movement" are the thing.

MERIT

The Shimer Round Safety Cylinderwith High Speed Knives



A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

Cross-Cut Mitre and Rip Saw Table

A machine with a reputation for speed and economy. Made throughout of the finest obtainable materials and exhibiting the most careful workmanship.

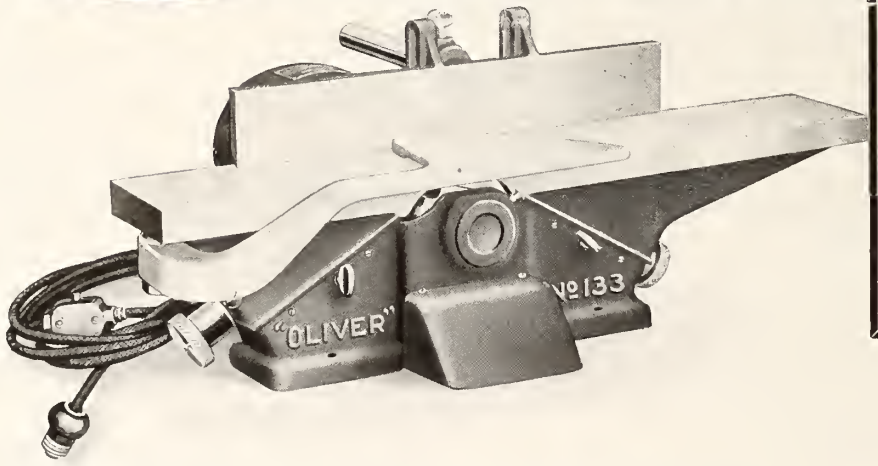
This machine would not be long in paying for itself, and the improvements in the quality of the work would at once be apparent.

Write us for full details, including prices, etc.

D. McKENZIE MACHINERY CO.
Manufacturers
Guelph - Ontario

Oliver

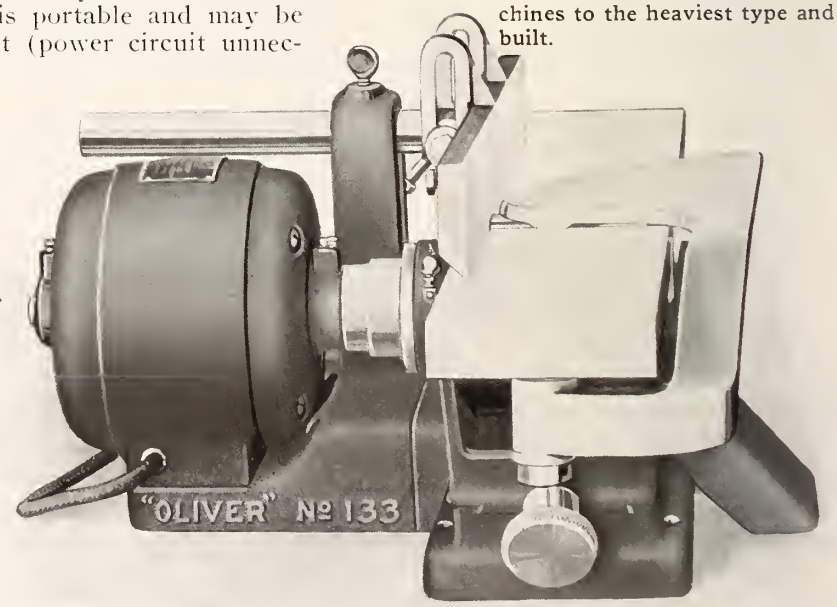
Portable Hand-Planer and Jointer



There is an "Oliver" Jointer to meet your requirements

They are made in sizes from these 4-inch and 6-inch portable machines to the heaviest type and size built.

This No. 133 Hand Planer and Jointer is built in 4-inch and 6-inch sizes. It is portable and may be connected to any lamp socket (power circuit unnecessary.) It is direct connected to ball bearing motor, efficient, quiet, well guarded, and is a wizard for work. It will do more jointing and planing in half an hour, and can do it better, than can be done in half a day by hand.



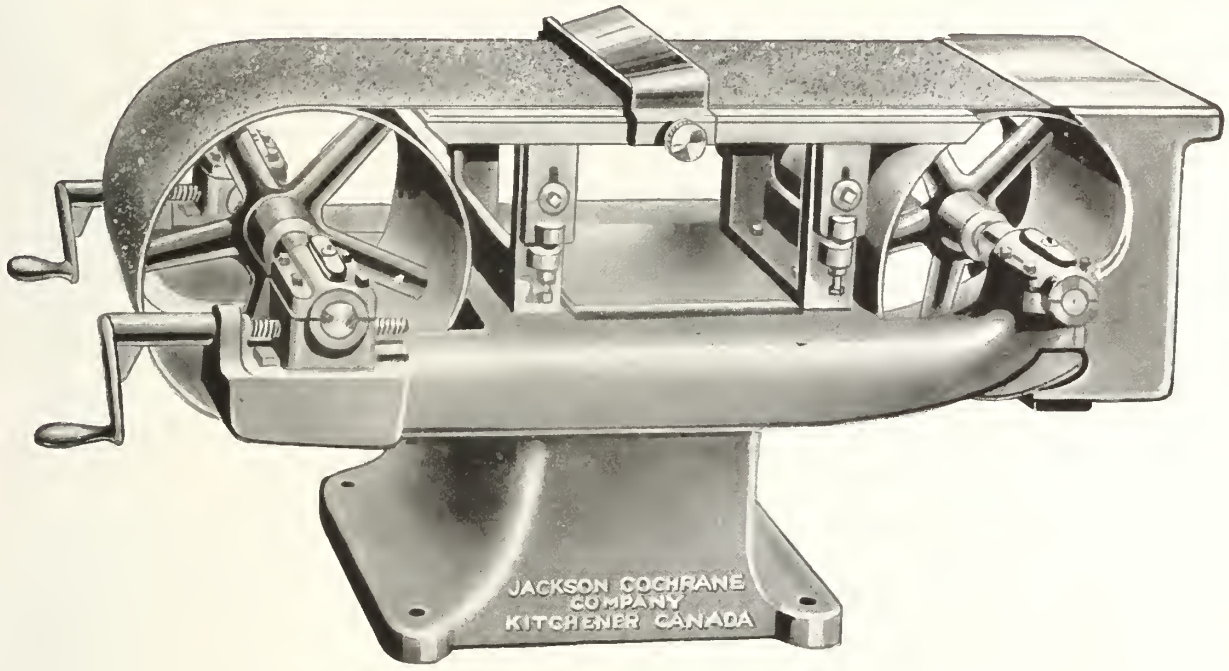
Let us send you further particulars.

Oliver Woodworking Machinery is better but costs no more.

Oliver Machinery Co., Grand Rapids, Mich., U.S.A

Carried in stock by the A. R. WILLIAMS Machinery Co., Toronto, Ont.

An Ideal Belt Sander at a Low Price



No. 283 Universal Sander

With this machine, all the objectionable features of the Disk and Drum Sanders are eliminated. The centre table is wide and long, planed perfectly true and has vertical adjustment for proper alignment. It is provided with an adjustable fence or rest which may be set to any desired position.

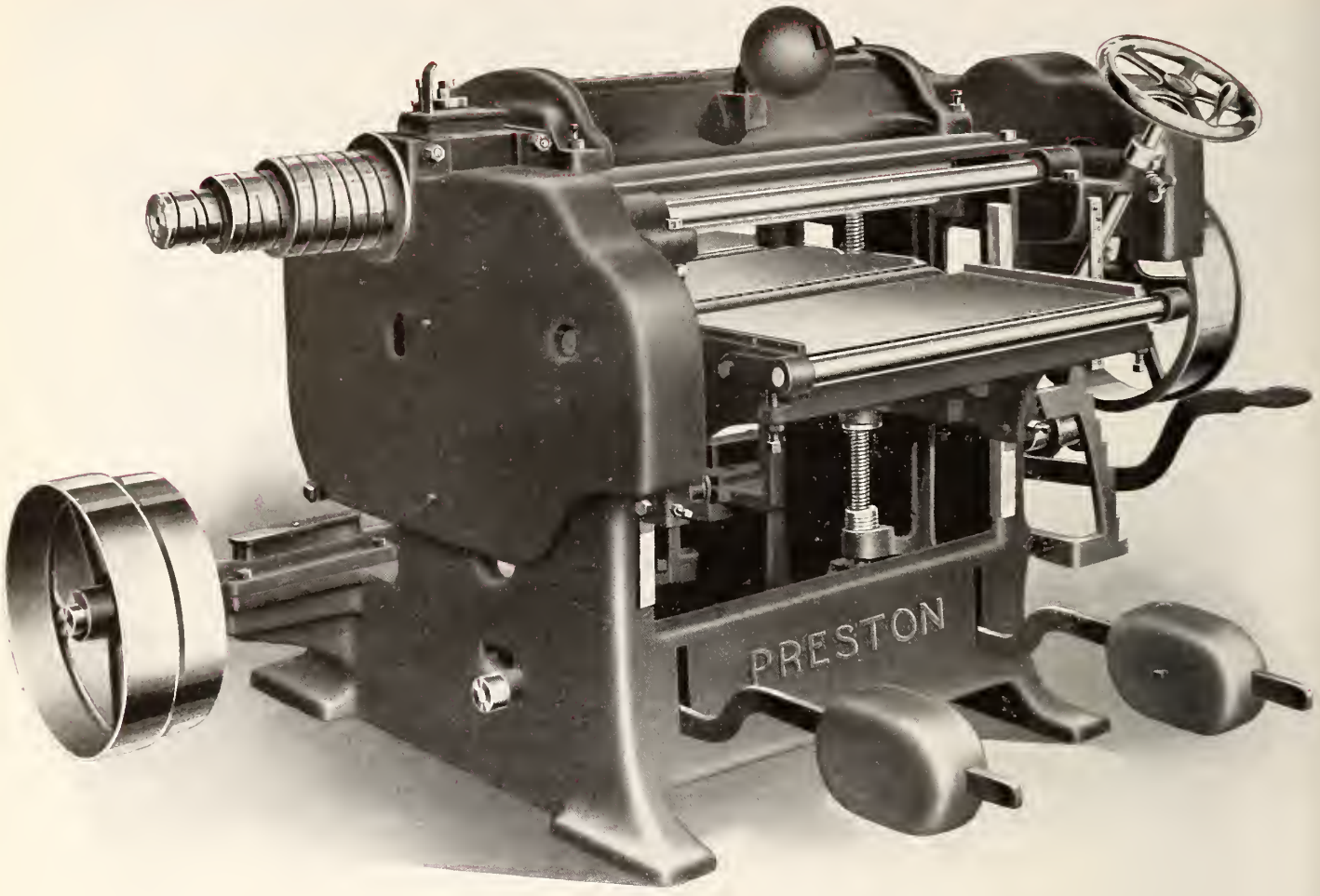
Especially adapted for sanding drawers, boxes, flat surfaces, rounding corners and any irregular or framed work. All parts of belt travel at same rate of speed ensuring a perfect finish.

Send now for circular and prices

Jackson, Cochrane & Company

KITCHENER - CANADA

No. 121 "Preston" Heavy Pony Planer



Cut Showing Standard Machine (note Guards)

This is our No. 121 Planer of improved design as now built

Planes 20″ and 24″ wide. 8″ thick

Features:—

1. Built with Straight Rolls (Standard Machine)
   or Divided Roll
   or Sectional Roll and Sectional Chipbreaker
2. Built with Square Cylinder with 2 carbon knives (Standard Machine)
   or Round Cylinder with 4 High Speed Knives.
3. Equipped with Whitney Type Babbitt Bearings (Standard Machine)
   or Specially selected SKF Ball Bearings.
4. Equipped with Stockbridge Electric Knife Grinder if desired, at extra cost.

Cylinder driven from one or both ends.

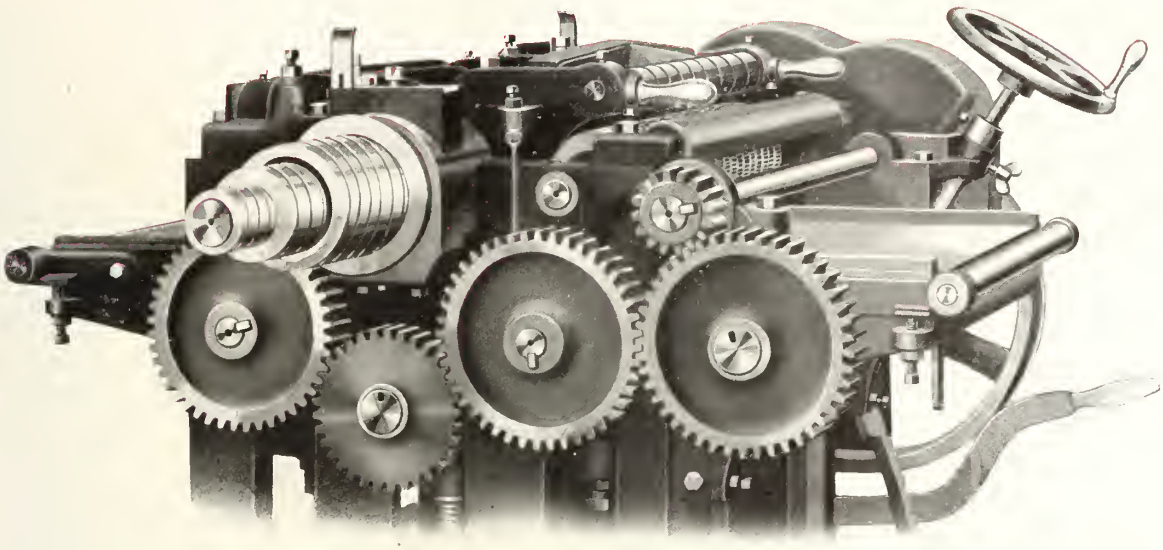
Every known improvement is embodied in this "Preston" Planer and in it we have produced a small planer which in quality and quantity of work produced will compete successfully with larger and higher priced machines.

The Preston Woodworking

PRESTON,

We are Sole Manufacturers of and Agents in Canada for the Eaglesfield Patented Beltless Swing Saw

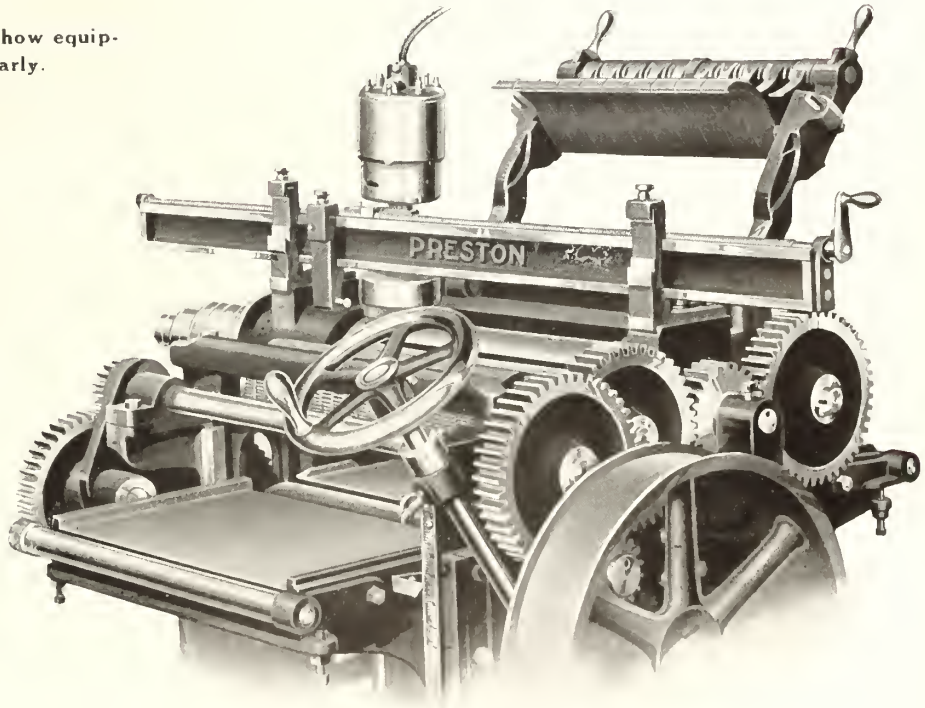
No. 121 "Preston" Heavy Pony Planer



Above cuts show Machine equipped with

. Specially selected SKF Ball Bearings.
2. Round Cylinder with 4 High Speed Knives.
. Sectional Roll.
4. Sectional Chipbreaker.

N B. Guards are removed to show equipment and construction more clearly.



ut at right is same as above ut shows machine equipped s well with Stockbridge Elec- ric Knife Grinder and Jointer vith which the Cylinder Knives are ground and jointed ight in their place on the ma- hine.

Ve would like to talk "Planer" o you whenever you are in the narket.

Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

Alphabetical List of Advertisers

Adjustable Clamp Co. 113
American Hardwood Lumber Co. 34
American Saw Filing Machine Co. 105
Anderson Tully Co. 97
American Walnut Mfrs. Association 28
Atlantic Lumber Company 46
Atkins & Co., E. C. 123
Atlas Mfg. Co., of Orlando 109
Ault & Wiborg Co. 78

Bachman Co., F. M. 94
Batavia Clamp Co. 113
Banning, Leland G. 49
Behr Co., Inc., Herman 22
B. C. Lumber Commissioner 34
Bigelow-Cooper Lumber Co. 29
Barr Holaday Lumber Co. 35
Bell Machine Co. 49
Birds Eye Veneer Co. 80
Black Bros., Co. 111
Bonner & Sons, J. H. 41
Bruce Co., E. L. 49
Bruce Woodworkers Ltd. 17
Buffalo Hardwood Lumber Dealers 42
Bury & Co., Robt. 50

Calhoun Plywood Co. 3
Canada Machinery Corporation 1
Canada Wood Specialty Co. 46
Canadian Appraisal Co. Ltd., The 15
Canadian Blower & Forge Co. 122
Canadian General Lumber Co. 103
Canada Glue Co. 20
Canadian Nishua Paper Co. 15
Canadian Powers Regulator Co. 4
Canadian S. K. F. 115
Cannon Canadian Co. Ltd. 20
Carborundum Co. 117
Carter & Co., E. T. 78
Casein Mfg. Co. 22
Celluloid Zapon Co. 19
Central Veneer Co. 85
Chapman & Dewey Lumber Co. 32
Chattanooga Machinery Co. 111
Clamp Nail Co. 109
Clarke Edward & Sons, Ltd. 44
Coignet Chemical Products Co. 119
Colborn, C. B. 40
Comfy Cushion Co. 73
Cosmos Chemical Co. 15
Cowan & Co. 12
Cutler Desk Co. 19

Decorators Supply Co. 21
Delaney & Pettit Limited 74
Des Moines Sawmill Co. 36
DeVilbiss Mfg. Co. 79
Doon Twines 74
Dry Kiln Door Carrier Co. 111
Dunlop Tire & Rubber Goods Co. 106

Eagle- Ottawa Leather Co. 72
Eaton & Sons, J. R. 28
Elliot Machinery Co. 121
Engineering & Machine Works of Canada Ltd. 120
Empire Tool Works 113

Farrin Lumber Co., The M. B. 50
Fay & Egan Co., J. A. 2
Foster, Merriam Co. 25
Frye Lumber & Veneer Co., J. W. 84

Garlock Machinery Ltd. 3
General Machinery Co. 20
General Hardwood Lumber Co. 30
Globe Vise & Truck Co. 119
Grand Rapids Vapor Kiln 112
Guelph Patent Cask. Co. Ltd. 87
Gulf Lumber & Trading Co. 41

Hafner Mfg. Co. 48
Hamilton Gear & Machine Co. 4
Hartzell, Geo. W. 37
Hay & Co. 95
Hay & Co., Peter 105
Hawker Mfg. Co., W. S. 18
Heeney. Percy E. 32
Hoffman Bros., Co. 85
Hyde Lumber Co. 41

Ideal Fence & Spring Co. of Canada, Ltd. . 73
Industrial Engineering Co. 109

Jackson Cochrane & Co. 9

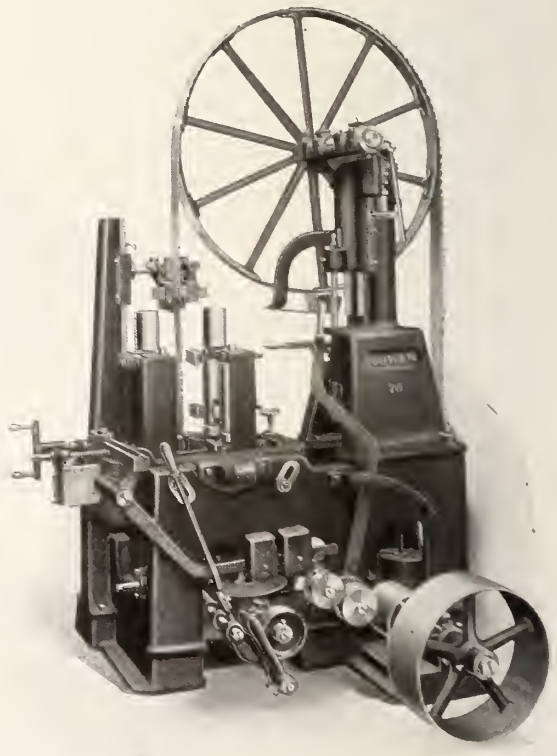
Kane Mfg. Co. 27
Kasebier Chatfield Shellac Co. 20
Kinnon Lumber Co., Ltd. 105
Klise Mfg. Co. 108
Klotz Machine Co. 111
Kosse,Shoe & Schleyer Co. 45
Kraetzer-Cured Lumber Co. 101

COWAN BAND RESAWS

The Most Satisfactory

42," 48", 54" and 60" Wheels
Various Capacities

Particulars and prices furnished on request



Cowan & Company of Galt
Limited

Galt - - Canada

What Time do You Require to Dry Two Inch Birch?

One of the largest Auto-body manufacturers in Canada is drying two inch Birch in an average of ten to eleven days, with its battery of NATIONAL AUTOMATIC HUMIDITY CONTROLLED DRY KILNS.

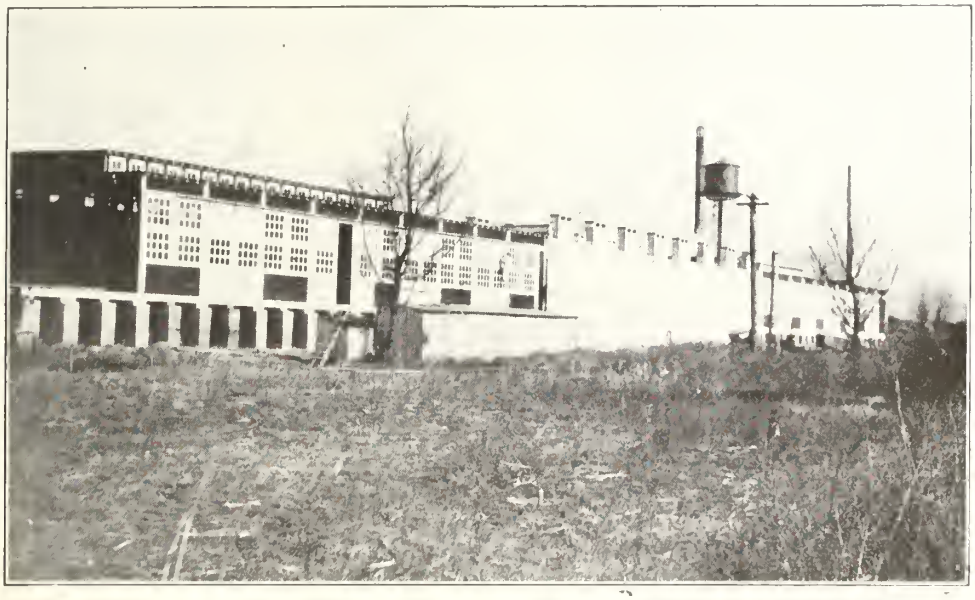
You say, "How can this be accomplished?"—for you probably have been contented in drying two inch Birch (six months air-dried) in from two to three weeks.

The Four Necessary Elements in the Drying Process are:

HEAT: HUMIDITY: VENTILATION: CIRCULATION:

In the NATIONAL AUTOMATIC HUMIDITY CONTROLLED KILN each of these elements is

Ample in Quantity, Flexible in Arrangement, Uniform in Distribution, Absolutely Under Control.



WHY BE HANDICAPPED? The best investment you can make is in an installation of a NATIONAL KILN. Let us figure with you on a new kiln or the remodeling of your present equipment. Write us full details to-day.

C. A. FIELDS, Canadian Representative, P. O. Box 55, TORONTO

OR

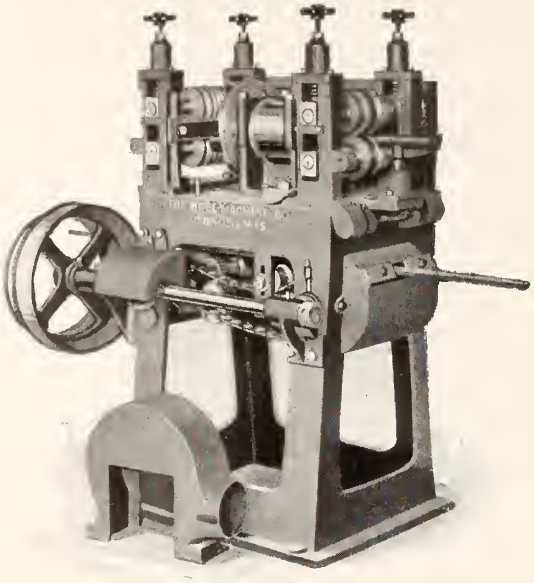
The National Dry Kiln Co., 1117 East Maryland Street., Indianapolis, Indiana

NATIONAL DRY KILNS

"The First Kiln in 6,000 Years in Which Humidity is Automatically Controlled."

Make Your Own Dowels With the "BELL" Machines

The Fastest and Most Practical Equipment For the Purpose



Adjustable Rod and Dowel Machine

The fastest dowel machine in the world.

Constructed to withstand the heavy and constant strain to which this type of machine is subjected.

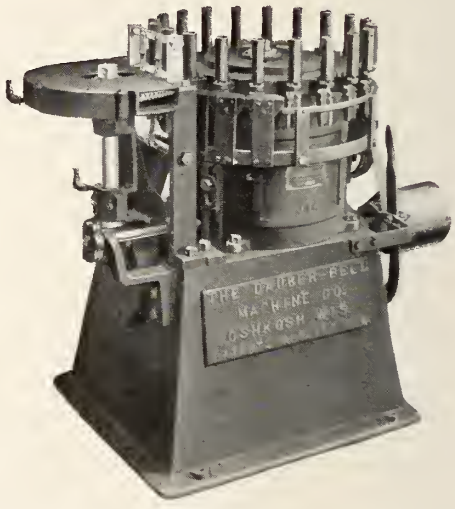
Equipped with a universal four-knife cutter head adjustable to turn rods of all diameters from 1/4" to 2" in either plain, spiral groove, longitudinal groove, or imitation reed wind. Special machine for turning rods of larger size.

Cutter-head mandrel is mounted at each end in ball-bearings of the highest grade.

Out-going feed rolls have combination of grooves so that many sizes can be made without changing feed rolls. The in-going feed rolls are adjustable for all sizes of squares.

Will work stock as short as 4½ inches.

Furnished with countershaft or motor drive.



Dowel Cutting Off and Pointing Machine

This machine is for cutting off and pointing dowel pins from long rods.

It will cut and point dowel pins of all diameters up to ¾", and in any length up to 6 inches.

Capacity of this machine is from 300 to 400 pins a minute. Any boy can operate it.

All working parts are completely enclosed and thus protected from dust and dirt.

Absolutely no danger to operator.

The floor space required by this machine is only 22" x 36".

Tight and loose pulleys on machine.

Furnished with belt or motor drive.

MANUFACTURED BY

The Bell Machine Company

(Successors to the Dauber-Bell Machine Co.)

Oshkosh, Wisconsin, U.S.A.

Representatives:

For Great Britain: THE OLIVER MACHINERY CO., 201 Deansgate, Manchester, England

For Canada: THE A. R. WILLIAMS MACHINERY CO. LTD., Montreal, Toronto, Winnipeg

The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5.000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

Buy Nashua Veneer Tapes

(Paper and Cloth)

QUALITY SUPREME

SERVICE UNEQUALLED

THE CANADIAN NASHUA PAPER CO., Ltd.

Peterborough, Ont.

A Better FINISH

You can improve the appearance and durability of your finishes and increase the saleability of your furniture by using

Cosmos High Grade Lacquers and Lacquer Enamels

Lacquer gives a permanent, waterproof surface that is tough and durable.

It dries rapidly, increasing the output of the finishing department. Successive coats may be applied at half-hour intervals, enabling work to be finished in one day.

Samples, prices and other particulars gladly furnished.

Our Specialties:

METAL LACQUERS
WOOD LACQUERS
ENAMELS
BRONZING LIQUIDS
EUREKA AIR BRUSHES
AMYL ACETATE
REFINED FUSEL OIL
COLLODION
BRONZE POWDERS
MATCHLESS METAL POLISHES AND BUFFING COMPOSITIONS
BANANA OIL

Cosmos Chemical Company
Port Hope Ontario

Alphabetical List of Advertisers—Continued

Laidlaw Bale-Tie Co. 112
Larsen & Shaw Ltd. 108
Litton Veneer Co. 84
Liverpool Hardwood Co., Inc. 18
Long Knight Lumber Co. 95
Luehrmann Hardwood Lumber Company, Chas. F. 34

Marietta Paint & Color Co. 74
Mattison Machine Works 124
May Hardwood Co., R. R. 34
McDonagh Lumber Co. 39
McKenzie Machinery Co., D. 7
McKnight & Son Co., L. G. 122
McLennan Lumber Co., Limited 46
Memphis Bandmill Co. 35
Memphis Veneer & Lumber Co. 85
Mercereau Hawkins Tie Co. 32
Merritt Engineering & Sales Co. 6
Miller Lumber Co. 31
Mohawk Veneer Co. 84
Monite Glue 26
Morgan Machine Co. 121
Mowbray & Robinson 38
Mmising Woodenware Co. 87
Murelle Lumber Co., L. D. 41

Nash, J. M. 122
National Dry Kiln Co. 13
National Patent Reed Sales Co. 21
Nichols & Co., A. S. 79
Northwestern Cooperage & Lumber Co. .. 83

Oakey & Sons, John 17
Ober Manufacturing Co. 113
Ohio Veneer Co. 83
Oliver Machinery Co. 8
Oriental Textiles Co. 73
Otis Mfg. Co. 43
Overton, S. E. 119

Pedwell Hardwood Lumber Co. 28
Penrod-Jurden Co. 86
Penrod Walnut & Veneer Co. 86
Perkins Glue Co. 23
Petrie Ltd., H. W. 119
Pettingell Machine Co. 105
Pickrel Veneer Co. 89
Porter Machinery Co., C. O. 109
Preston Woodworking Mach. Co 10-11
Purcell Walnut Lumber Co., Frank 38

Radcliff Saw Mfg. Co. .....
Reese-Sheriff Lumber Co. 45
Reynolds Machine Co. 110
Richards Hardwood Co. 30
Richards-Wilcox Canadian Co. 105
Rush Lumber Co. 39

Shantz, P. E. 22
Shimer Cutter Head Co. 7
Shurley Dietrich Co. 107
Sidmans Limited 103
Simonds Canada Saw Co. 17
Smith Lumber Co., Payson 34
Smith, Sam D. 30
Sondheimer Co., E. 29
Standard Dry Kiln Co. 16
Standard Veneer Co. 85
Stark & Co., Jas. E. 39
Steels & Hibbard Lumber Co. 39
Stimson & Co., J. V. 40
Stimson Hardwood Co., J. V. 33
Stimson Veneer & Lumber Co. 33
St. Joseph Iron Works 107

Taylor Mfg. Co., Jas. L. 110
Thomas & Proetz 31
Toronto Veneer Co. 93
Toronto Hardwood Lumber Co. Ltd. 93
Turner-Farber Stove Co. 99
Thompson & Co., Lewis 47

Vail Cooperage Co. 48
Valley City Machine Works 112
Van Atta & Co., E. B. 111
Veneer Manufacturers Co. 87

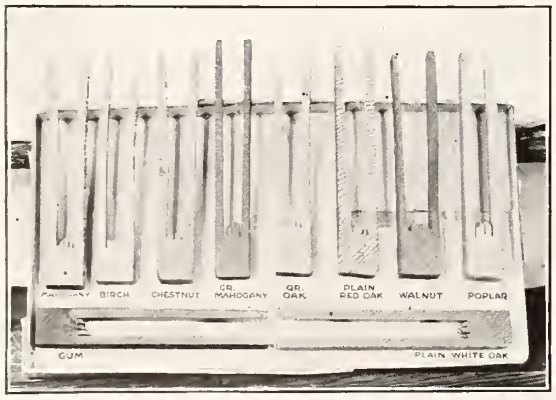
Waddell Mfg. Co. 108
Walter & Sons, J. 24
Watertown Table-Slide Co. 22
Wayne Lumber Co. 40
Willey Co., C. L. 91
Williams Machinery Co., A. R. 6
Williamson Veneer Co. 88
Wisconsin Veneer Co. 84
Wood Mosaic Co. 90

Yates Machine Co., Ltd. P. B. 5
Yellow Poplar Lumber Co. 47
Young Lumber Co., Bedna 40

The STANDARD Saves Money

for

Globe-Wernicke



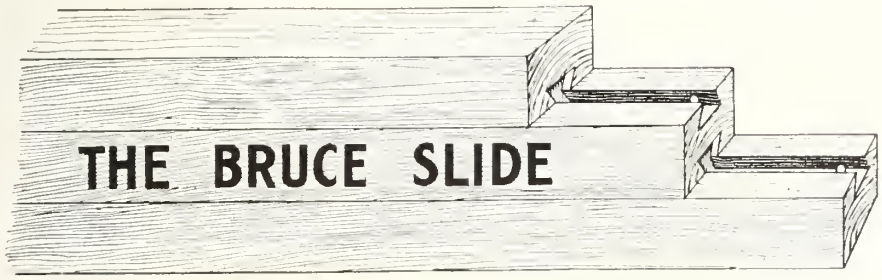
A box of actual test pieces cut by their operator in one day, making his regular tests—9 ***different*** drying problems handled with perfect results in The Standard Automatically Controlled Kilns.

9 different kinds!
Green and air-dried—
For a quality product.

Our new literature tells how to make these tests—get it for your kiln file. Address us at 1542 McCarty St., Indianapolis, Ind.

The Standard Dry Kiln Co.

TABLE SLIDES TABLE RIMS TABLE PINS



Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

SIMONDS

Novelty SAWS

High-grade Steel and perfect mechanical construction make Simonds Novelty Saws leaders everywhere. They cut smooth and hold their tension and cutting-edge longer.

We also make Concave, Groover and Special Circular Saws as well as Big Circular and Band Saws, Planer Knives and Files.

Write for Prices

Simonds Canada Saw Co., Limited

"The Saw Makers"

Montreal, Que. - St. John, N. B. - Vancouver, B. C.

OAKEY'S

Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

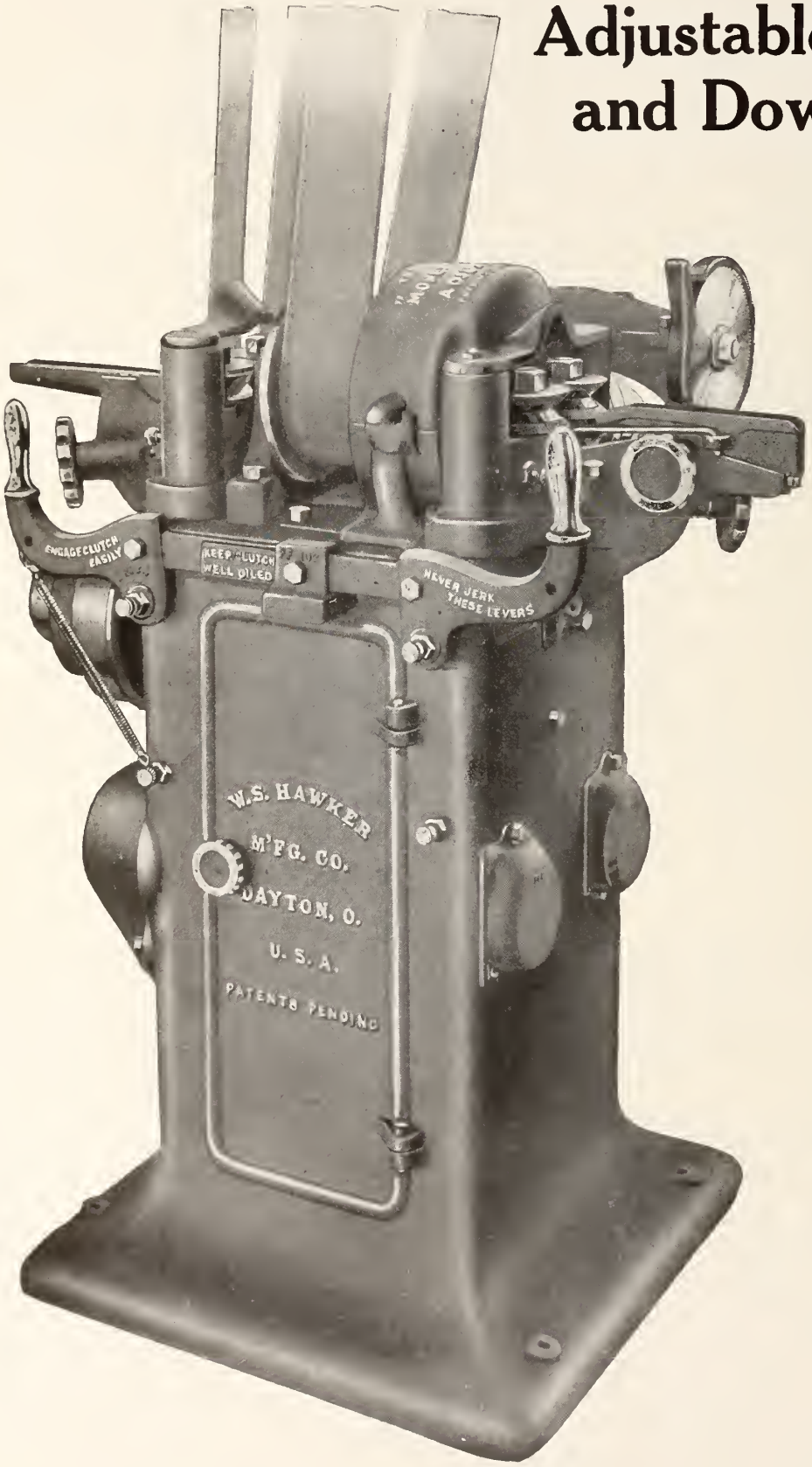
JOHN OAKEY & SONS LTD.,

WELLINGTON EMERY AND BLACK LEAD MILLS
LONDON, S. E. 1.

Canadian Agents:

P. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

The Money Maker— Adjustable Rod and Dowel Machine



Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio

The wood finish that will not paper mark in shipment

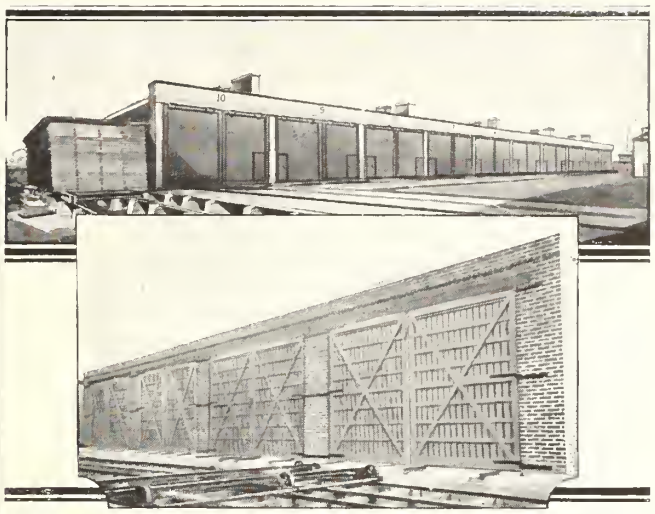
A product finished with ZAPONITE, the Pioneer Wood Lacquer, is proof against the harmful effects of paper marking when wrapped and packed for shipment.

Being extremely hard and uneffected by moisture, heat and climate changes, a ZAPONITE finish never gets "sticky," it never paper marks and it never shows the imprint of burlap wrappings—another reason why ZAPONITE is the ideal finish for quality products made from wood.

Let our Service Division help you to determine how ZAPONITE can be used in finishing your products at a SAVING in your production costs. Write us about this service TODAY.

Celluloid Zapon Company
200 Fifth Avenue, New York City
Branches: Chicago, New Haven, Los Angeles

THE PIONEER
ZAPONITE
WOOD LACQUER



10 Kilns or 4 Kilns

Both of these installations have the same drying capacity

Each will dry 24000 board feet four quarter white oak from 25% to 6% moisture content per day.

THE large picture is a photograph of a battery of dry kilns of the ordinary ventilating type. The smaller picture is a photograph of Cutler Kilns of the same drying capacity.

Because a Cutler Kiln dries twice as fast it will do the work and do it better than a larger kiln of the old type. It will save half the time and half the money. Every Cutler Kiln user is a Cutler booster.

4 Cutler Engineers to help you

The Cutler Planning Engineer will be glad to work with you in designing a kiln to meet your particular requirements.

The Cutler Production Engineer will supervise the actual construction of your kiln and stay with the job until your men do get perfect results.

The Cutler Research Engineer is prepared to give you all latest statistical information, kiln records and new data.

The Cutler Service Engineer, available at all times, will help you solve any technical problems which may arise in your work.

The Cutler Kiln and Cutler System of Service is revolutionizing dry kiln methods.

Write for catalog, or better still state quantity and kind of lumber wanted per day as a base for a proposal. There is no obligation. Write today.

CUTLER DESK CO.,
Dept. F. Buffalo, N.Y.

Cutler
DRY KILNS
Better drying in half the time

WATCH FOR THE BULL DOG

UNIFORMITY

When used in describing a **Cannon Glue** is more than a claim. It is an established **fact!**

We have customers in Canada who have used one brand for fifteen to twenty years without one cause for complaint.

CANNON CANADIAN CO., LTD.
TORONTO MONTREAL

To secure
Perfect White Shellac Varnish
it must be made from

Kasebier Quality Guaranteed Kiln Dried Bleached Shellac

KASEBIER-CHATFIELD SHELLAC CO.
KASEBIER QUALITY GUARANTEED
EST 1881
BLEACHED SHELLAC
KASEBIER QUALITY HAS EARNED ITS REPUTATION THIS LOT WAS MADE WITH THE DETERMINATION TO KEEP IT
NEW YORK, N.Y.

Insist that the White Shellac you buy is made from our Bleached Shellac

Kasebier-Chatfield Shellac Co.
No. 7 Cedar St., N. Y. C.

New and Used Woodworking Machinery

We Can Save You Money—Look over our partial list and if you do not see your requirements—Write, wire or phone us.

60″ Three Drum Sander Berlin.
42″ Three Drum Sander Berlin.
12″ 4-Side Goldie McCullough Moulder.
7″ 3-Side Cowan & Co. Moulder.
20″ Major Harper Pony Planer.
24″ Major Harper Poney Planer.
10″ Universal Woodworker McGregor Gourlay.
24″ Power Feed Jointer Preston.
C. M. C. Dowelling Machine 5/8, 3/4 & 1″ Heads.
36″ Preston Band Saw.
No. 125 Preston Trim & Rip Saw.
1—8′-0″ Mattison Belt Sander.
Roller Top Saw Tables Wood Frame.
Belt Sanders.
Disc & Bob Sander.
6′ Linderman Dovetailer & Glue Jointer.
42″ Jackson Cochrane Band Rip Saw.
38″ American Veneer Presses.
Chapman Ball Bearing Elevating Floor Truck.
Exhaust Fans.
30″ x 12″ McGregor Gourlay Double Surfacer.
Power Feed Rip Saw.
Combination Lath Machine, Green.
Motors & Transmission.
1—2 Spindle Shaper.

GENERAL MACHINERY Company
67-69 Frederick St., TORONTO
TELEPHONE MAIN 2200

¶ The advertisements of the leading manufacturers will bring you into touch with trade conditions and the better qualities of engineering products.

Hugh C. MacLean Publications

Contract Record & Engineering Review, Electrical News, Western Canada Coal Review, Canada Lumberman & Woodworker, Western Lumberman, and also Canadian Woodworker & Furniture Manufacturer, Footwear in Canada and the Commercial. MacLean Building Reports give advance information on all building, engineering and construction in Canada.

TORONTO
MONTREAL
NEW YORK
LONDON

PUBLISHING HOUSE OF HUGH C. MacLEAN

WINNIPEG
VANCOUVER
CHICAGO
ENGLAND

FIBRO-KANE

PATENTED

OPEN WEBBING

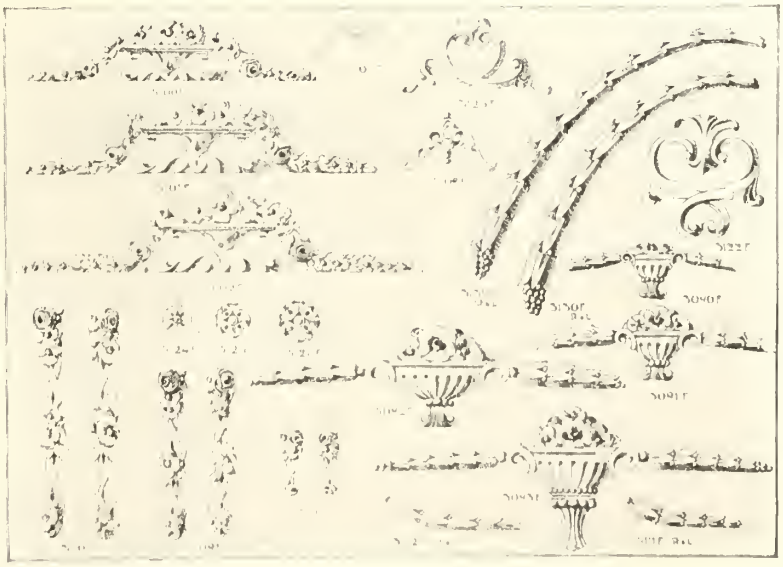
NATIONAL PATENT REED SALES COMPANY

DREXEL BUILDING

PHILADELPHIA, PA.

PERIOD CARVINGS *for* FURNITURE

Largest Manufacturers of Imitation Wood Carvings in the World Quality the Best. Prompt Shipments



Unlimited Facilities for Manufacturing High Grade Wood Carvings in Composition and Wood Fibre

Reproductions of Exclusive Designs Our Specialty

THE DECORATORS SUPPLY CO.

2543 ARCHER AVENUE, CHICAGO

New Catalog Sent on Request

It Pays to Use the Best Table Slides

A table slide that refuses to work properly is a source of continual annoyance to the customer. You can avoid it by using the famous Roller-Bearing Equalizer Slides.

Write us for Prices.

Watertown Table-Slide Company

Watertown, Wisconsin U.S.A.

OPENKOTE

Garnet Finishing

Costs no more than any other

Send for samples at no cost to you

THE "OPENKOTE" PROCESS is our invention. All Garnet grains are arranged scientifically to create "valleys"—spaces between kernels—for dust clearance, longer wear, even surface, no sand on top of sand, no scratches, less bulk, greater flexibility.

It's the "finishing touch" in sandpaper—Be sure and say -- Behr's Openkote.

Every kernel of sand is an Imp of Efficiency eager to work for you.

HERMAN BEHR & CO., INC.

In business Fifty Years 1872 1922

31-63 TIFFANY PLACE BROOKLYN-NEW YORK CITY

"Casco" for a better product

WATERPROOF GLUE
For Jointing and Veneering

STRONG - UNIFORM
USED COLD - EASILY PREPARED
ECONOMICAL

"CASCO" Uniformity is assured because we manufacture our own Casein. : : :

The Casein Manufacturing Company
Largest and Longest Established Manufacturers of Casein Products in America : : :
15 PARK ROW, - NEW YORK CITY

Write for "CASCO" Red Book—a manual on Veneers, Panel-Making and Glue.

Samples of "CASCO" on request.

Canadian Distributors
HART & LEFEBER, LTD.
510 Drummond Building
Montreal, Que.

FACTORY TRUCKS

Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY

P. E. SHANTZ, PRESTON, ONTARIO.

Factory Truck Style No. 26.

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

SATISFACTION

There is no keener satisfaction than that which comes from making a wise and careful purchase.

The worthy article bought becomes a grateful reminder of the soundness of the choice, and in service ever justifies the investment made.

Builders of plywood construction require a glue that is dependable in quality at all times and purchasers of Perkins Vegetable Glue have the keen satisfaction that comes from buying a uniform and dependable product.

Perkins Glue Company

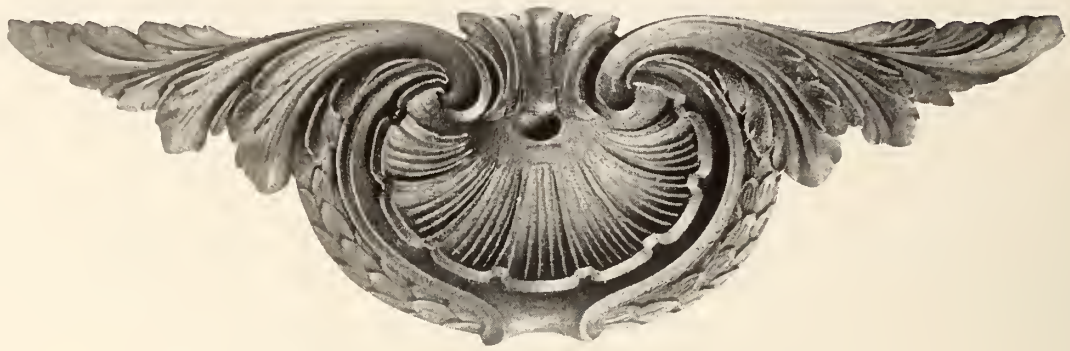
Factory and General Offices
LANSDALE, PENNSYLVANIA

Sales Office
SOUTH BEND, INDIANA

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

Patents covering Perkins Glue have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.



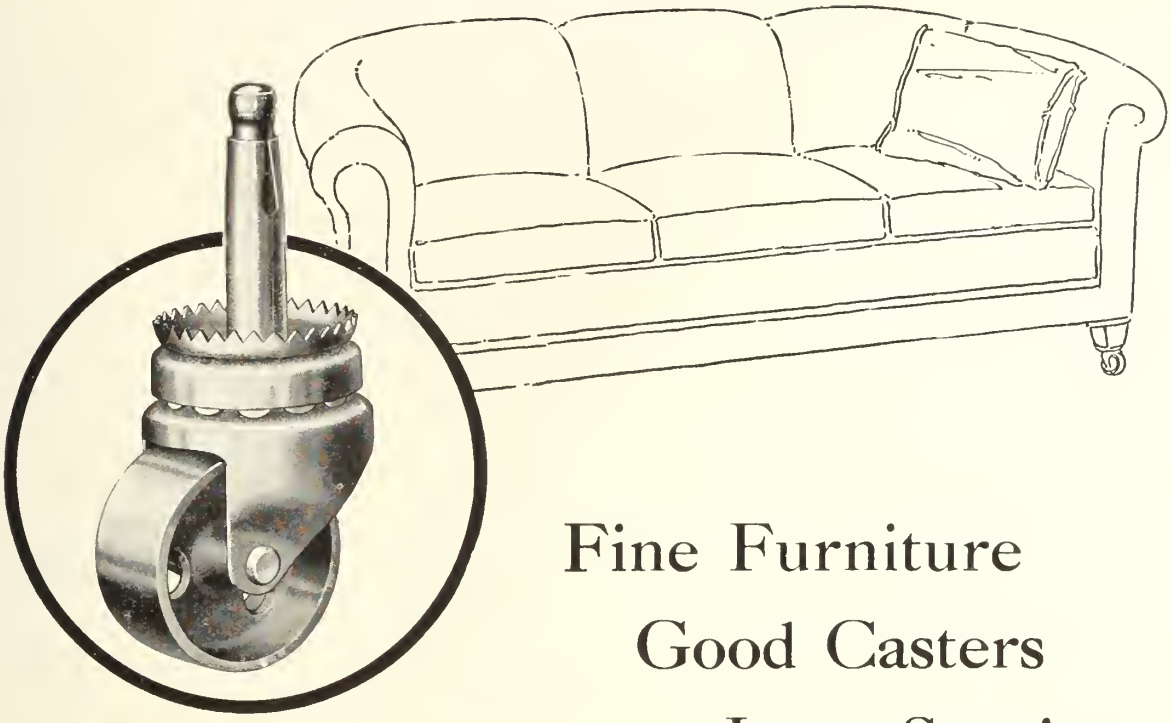
A great many new designs, the result of our late President's visit to Europe, will be added to our line. New illustrations of this addition will be ready for the mail in the course of another sixty days.

Our aim is to supersede all others in our line of manufacture, in quality, design and service. An organization is in the course of construction, that we hope will be the fulfilment of the ideal of the founder of our business, and be a monument to his memory.

Suggestions and enquiries are always gratefully received. Your co-operation and confidence is appreciated

JOHN WALTER & SONS LIMITED

KITCHENER :-: ONTARIO



Fine Furniture Good Casters Long Service

THESE three things go together just like work, health and happiness.

Keep the first two on the job and the last tags along just naturally.

Efemco Casters are *good casters.*

They're sturdy, they always roll and never jam.

Roller bearings make them respond at a touch to a change of position.

There is an **Efemco** Caster for every use—one best adapted to each particular purpose.

Send for our latest catalog

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

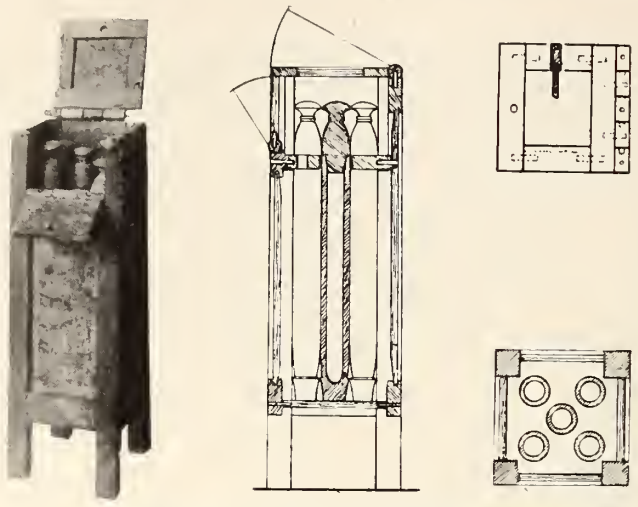
Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters

Roller Bearing Casters
Truck Casters
Automobile Accessories

Piston Rings
Grey Iron Castings

Standardized by 87 years of service.



Grecian lady's cosmetic cabinet 2300 years old (300 B.C.) now in the Berlin Museum. It once contained cold-cream, rouge and eyebrow pencils.

MONITE WATERPROOF GLUE

is as great an improvement over the casein waterproof glue formula of the Greeks as the modern battleship is over the 300-oared war-galley of ancient Greece.

The Greeks Used This Glue 2500 Years Ago!

The following is translated from pp. 121-2 of "The Story of Furniture" ("Geschichte des Mobels") by A. Koeppen and C. Breuer, published at Berlin in 1904.

"Glue was a favorite fastener. There were two kinds of glue, the common kind, joiner's glue made from animal offal and fish bladders * * * and also the glue made from caustic lime and white of egg or casein, which had already been discovered by the Egyptians.

"Their wish to construct rich furniture at lower cost, as well as the experience that the use of a suitable core-wood makes flat pieces warp less than when heavy boards of costly wood were used. led them to adopt ply-work. This was cut with saws and fastened to an under layer of other wood with glue. Thus they made table-tops, chests, beds, etc.

"How widely this work was done in the olden times, there is much existing evidence that has been found in the graves of Crimea."

Ply-work, tenon or mortise joints; marvelous inlaid work giving pictorial effects with varied woods, tortise-shell, ivory, metals and precious stones were all made by the early Greeks with the aid of casein waterproof glue as early as 500 B.C. **2500 years ago!** Many excellent specimens of their work still remain—in European and American museums.

Monite Waterproof Glue is the modern scientifically perfected form of the casein waterproof glue used by the ancient Egyptians and Greeks. Joints and ply-wood made with MONITE are far superior to this glue-work of the Greeks which has endured 25 centuries.

Monite Waterproof Glue produces joints and panels that are heat and waterproof, glues wood with high or low moisture content, is mixed and applied by machinery or by hand, needs clamps for only 3 or 4 hours. It is as strong as hot glue and **costs but little more than vegetable glue.**

Let us send you a small sample panel made with MONITE for you to test by boiling, soaking, and baking. Write for the panel and our printed matter, NOW.

Canadian Representatives:

W. H. CUNNINGHAM & HILL CO. LTD. - TORONTO, CANADA

MONITE WATERPROOF GLUE CO.

MANUFACTURERS OF COLD GLUE IN POWDERED FORM

1628 N. 2nd Street MINNEAPOLIS, MINN.

STOCKS AND REPRESENTATIVES IN ALL PRINCIPAL CITIES.

Special Bulletin

JUDGE F. A. GEIGER

UNITED STATES DISTRICT COURT MILWAUKEE, WIS.

In a Desicion Rendered May 3, 1922
in the case of

PERKINS GLUE CO., Plaintiff
vs
GOULD MANUFACTURINC CO.,
WISCONSIN CHAIR CO., Defendents

—*"the proof in this case clearly absolves the defendents from any charge of infringement.*

A decree dismissing the bills may be entered accordingly."

Kane Vegetable Glue

Is No Infringement On Any Existing Patents

The trade is now at liberty to use KANE VEGETABLE GLUE without fear of the intimidations of any patentee. Copy of the decision will be mailed to the trade as soon as off the press.

WE SOLICIT YOUR BUSINESS

Prompt Shipment

KANE MANUFACTURING CO.

1832-34 South Clark Street CHICAGO, ILL.

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVENUE : : TORONTO

Full or mixed cars for immediate delivery

HARD and SOFT MAPLE
BEECH BIRCH
ROCK and SOFT ELM
and BASSWOOD

Hardwoods in 4 x 4, 4 x 6, 1″ and 2″. No. 3 Common.

Why not get in touch with us?

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

AMERICAN WALNUT

"The Cabinet-wood of the Ages"

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

Insure Your Profits

Did you ever stop to reflect, Mr. Manufacturer, on the fact that you are always sure of a **ready sale at a fair price** for anything you make in WALNUT?

The demand for American Walnut in furniture, interior trim and cabinet work of all kinds has been **steady** for centuries.

There are a lot of people who know and appreciate that the value of Walnut is genuine—an inherent quality and beauty that is never effaced. And the kind of people who have that appreciation are usually the people who have the money to gratify their desires.

Incidentally, our steadily pursued policy of national advertising is constantly widening the circle of those who want Walnut and is teaching them to be sure that they get real Walnut. It pays to use Walnut.

Our "Walnut Book" cotnains many valuable ideas and suggestions for the trade. We will gladly send you a copy on request.

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO, U. S. A.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft..... ..3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft... .... ..8/4 No. 1 Com

Band-mills at Baton Rouge, La., Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.
BAY CITY - - MICHIGAN

SAM D. SMITH

Wholesale Dealer and Manufacturer in

NORTHERN and SOUTHERN HARDWOODS

305 Kent Building, Toronto

Specialty—Sawing Dimenison Stock to Order

H. J. RICHARDS J. T. KENDALL

Richards Hardwood Company

746-7 BANK OF COMMERCE BUILDING

Memphis, Tennessee, U. S. A.

Successors to Dacus-Richards Hardwood Co.

We make a specialty of catering to the Canadian trade and are in position to make reasonably prompt shipment of practically any Southern Hardwoods which you are needing. Your orders and inquiries will be highly appreciated and will receive our prompt and personal attention.

Specializing in Delta Red and Sapgum, Oak, Elm and Poplar.

The recent flood conditions prevailing throughout the South have heavily curtailed shipments. We have at our Central Illinois concentration yard an ample stock of Oak and Gum, available for immediate shipment, and especially invite your orders on the following.

4/4 Plain White Oak—FAS @ $120.00 No. 1 C&S @ $70.00 M.
4/4 Plain Red Oak—FAS @ 117.00 No. 1 C&S @ 65.00 M.

These prices are f.o b. Toronto rate of freight, and all stock is offered subject to prior sale.

GENERAL HARDWOOD LUMBER COMPANY

118 North La Salle Street - - - - - CHICAGO, ILL.

"Quality Lumber guarantees value received"

Miller Lumber Company

Marianna - Arkansas

QUARTERED WHITE OAK

3,000′	3/4	No. 2 C&B.
37,000′	4/4	FAS
1,600′	8/4	FAS
7,500′	5/4	No. 1 C&B
5,000′	8/4	No. 1 C&B
300,000′	4/4	No. 1 Com.
2,800′	5/4	No. 1 Com.
5,000′	8/4	No. 1 Com.
165,000′	4/4	No. 2 Com.
2,000′	5/4	No. 2 Com.
400′	6/4	No. 2 Com

PLAIN WHITE OAK

120,000′	4/4	FAS
18,000′	5/4	FAS
280,000′	4/4	No. 1 Com.
35,000′	6/4	No. 1 Com.
6,500′	8/4	No. 1 Com.
60,000′	4/4	No. 2 Com.
12,000′	5/4	No. 2 Com.
12,000′	6/4	No. 2 Com.
20,000′	8/4	No. 2 Com.

QUARTERED RED OAK

3,000′	3/4	No. 2 C&B
100,000′	4/4	No. 1 & No. 2 Com.
1,000′	5/4	No. 2 C&B
3,500′	8/4	No. 2 C&B

PLAIN RED OAK

6,000′	5/4	FAS
2,000′	6/4	FAS
200,000′	4/4	No. 1 Com.
15,000′	5/4	No. 2 Com.
12,000′	8/4	No. 2 Com.

MISCELLANEOUS OAK

35,000′	5/8	FAS Pl. Wh. Oak
50,000′	5/8	No. 1 & No. 2 Wh. Oak
10,000′	4/4	3-5 ½ clr. Qt. Wh. O. Strips
1,000′	5/4	Pl. R. Oak Step Plank
20,000′	5/4	No. 3 Com. Oak
22,000′	6/4	No. 3 Com.
40,000′	8/4	R&W Oak Bridge Plk.
40,000′	10/4	R&W Oak Bridge Plk.
100,000′	12/4	R.O. Bridge Plank
50,000′	12/4	W.O. Bridge Plank

QUARTERED FIG. RED GUM

15,000′	8/4	FAS

PLAIN RED GUM

1,100′	5/8	FAS
1,800′	3/4	No. 2 C&B
40,000′	4/4	FAS
18,000′	5/4	FAS
1,800′	6/4	FAS
8,000′	6/4	No. 1 Com.
20,000′	5/4	No. 1 Com.
25,000′	4/4	No. 2 Com.
40,000′	5/4	No. 2 Com.
2,500′	6/4	No. 2 Com.
3,000′	8/4	No. 2 Com.

SAP GUM

17,000′	3/4	FAS
20,000′	3/4	No. 1 Com.
50,000′	4/4	FAS & Box Boards 9-12″
100,000′	4/4	FAS 13-17″
50,000′	4/4	FAS & Bx. Boards 13-17″
60,000′	4/4	Box Boards 13-17″
18,000′	4/4	18″ & Up Pnl. & Wd. No. 1
15,000′	5/4	FAS
20,000′	5/4	No. 1 Com.

TUPELO

39,000′	4/4	6-12″ FAS
5,200′	4/4	13-17″ FAS
12,500′	4/4	9-12″ Bx. Bds.
4,700	4/4	13-17″ Bx. Bds.
20,000′	4/4	No. 1 C&B.

COTTONWOOD

30,000′	4/4	13-17″ FAS
15,000′	4/4	9-12″ Bx. Boards.
30,000′	4/4	13-17″ Bx. Boards.
175,000′	4/4	No. 1 Com.
75,000′	4/4	No. 2 Com.

CYPRESS

15,000′	4/4	FAS
15,000′	5/4	FAS
10,000′	6/4	FAS
24,000′	8/4	FAS
50,000′	4/4	Select
25,000′	5/4	Select
40,000′	8/4	Select
150,000′	4/4	No. 1 Shop
20,000′	5/4	No. 1 Shop
10,000′	7/4	No. 1 Shop
150,000′	4/4	No. 1 Com. 3-7″
50,000′	4/4	No. 1 Com. 3″ & Up
300,000′	4/4	No. 1 Com. 8-12″
30,000′	5/4	No. Com. 1
150,000′	4/4	No. 2 Com. 8-12″

Thomas & Proetz Lumber Co.

3406 N. Hall St.

ST. LOUIS, MO.

BELZONI, MISS. —— MILLS —— **CALION, ARK.**

Com. & Btr. Quartered White Oak
1″ —925,000 ft.
1¼″—335,000 “
1½″—115,000 “

Com & Btr. Quartered Red Oak
1″ —380,000 ft.
1¼″—150,000 “
1½″—275,000 “

Com. & Btr. Plain Red Oak
1″ —150,000 ft.

Com. & Btr. Plain White Oak
1″ —150,000 ft.
1½″—250,000 “

Com & Btr. Red Gum Plain & Quartered
1¼″—300,000 ft.
2″ —500,000 “
2½″—235,000 “
3″ —180,000 “

Com. & Btr. Sap Gum
1″ —350,000 ft.
1¼″—433,000 “
1½″—750,000 “
2″ —980,000 “
2½″—170,000 “
3″ —350,000 “

Com. & Btr. Quartered Black Gum
1″ —290,000 ft.

Com. & Btr. Tupelo
1″ —235,000 “

Mercerea-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

FOR IMMEDIATE SHIPMENT

10 cars 4/4 No. 2 C & B. Birch
4 cars 5/4 No. 1 C & B. Birch
5 cars 6/4 No. 1 C & B. Birch
7 cars 8/4 No. 1 C & B. Birch
2 cars 10/4 No.1 C & B. Birch
3 cars 12/4 No. 1 C. & B. Birch
3 cars 16/4 No. 1 C & B. Birch
4 cars 8/4 No. 2 & No. 3 Com. Birch
20,000 ft. 4/4, 5/4, 6/4, mostly 4/4 and 5/4 Canadian Cherry No. 1 C & B. 6/14 inches wide.
40,000 ft. 4/4 No. 1 C & B. Basswood
30,000 ft. 6/4 FAS. Maple, very choice stock
400,000 ft. 1 x 3 and up Spruce Crating
200,000 ft. 2 x 3 and up Spruce Crating
400,000 ft. 5/8 x 3 and up Spruce Crating

Write, Wire or Phone Inquiries

PERCY E. HEENEY

Office: 298 Breithaupt St., KITCHENER, ONT.

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

British Columbia Lumber Commissioner

Display rooms and offices have been removed to 51 YONGE STREET (Ground floor)

where a complete display of British Columbia forest products will be installed, including several rooms to full scale, finished in BRITISH COLUMBIA WOODS and completely furnished, showing exterior walls and roof of British Columbia red cedar with thatched roof effect. Also, a complete display of every grade of all British Columbia woods in commercial sizes and a complete line of British Columbia boxes and RED CEDAR SHINGLES.

You are cordially invited to call and see our exhibit.

Main 6872 TORONTO 51 Yonge St.

See R. R. May

At Sixth and A

Lousville, K.

U. S. A.

Lumber O.K.

Shipment Right Away

What You Say

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

DRY STOCK

For Immediate Shipment

	SOFT ELM			SOFT MAPLE	
6905′	1″	—No. 1 C&B	14397′	2½″	—No. 1 C&B
3195′	1″	—No. 2 Com.		BASSWOOD	
41030′	1½″	—No. 1 C&B	1549′	1″	—No. 1 C&B
2356′	1½″	—No. 2 Com.	606′	2″	—No. 1 C&B
56880′	2″	—No. 1 C&B		BUTTERNUT	
10046′	2″	—No. 2 Com.	2584′	1″	—No. 1 C&B
110594′	2½″	—No. 1 C&B		HARD MAPLE	
26985′	2½″	—No. 2 Com.	31788′	1″	—No. 1 C&B
11750′	3″	—No. 2 Com.	243927′	1¼″	—No. 1 C&B
	WHITE ASH		227707′	1½″	—No. 1 C&B
87846′	2″	—No. 1 C&B	1796′	1½″	—No. 2 Com.
3072′	2″	—No. 2 Com.	217401′	2″	—No. 1 C&B
139960′	2½″	—No. 1 C&B	11410′	2″	—No. 2 Com.
18587′	2½″	—No. 2 Com.	38016′	2½″	—No. 1 C&B
18992′	3″	—No. 1 C&B	11091′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.	2796′	4″	—No. 1 C&B
	HICKORY			BEECH	
650′	1″	—No. 1 C&B	3000′	1½″	—No. 2 Com
1408′	2″	—No. 1 C&B	500′	2″	—Log run
	COTTONWOOD		250′	2½″	—Log run
1620′	1″	—No. 1 C&B	350′	3″	—Log Run
19956′	2″	—No. 1 C&B	100′	4″	—Log run
1196′	2″	—No. 2 Com.		BIRCH	
	BLACK WALNUT		15993′	1″	—No. 1 C&B
2873′	1″	—No. 1 C&B	22811′	1¼″	—No. 1 C&B
1151′	1″	—No. 2 Com.	11748′	1½″	—No. 1 C&B
	WILLOW		50157′	2″	—No. 1 C&B
1446′	1″	—No. 1 C&B	87172′	2½″	—No. 1 C&B
	CHERRY		7866′	3″	—No. 1 C&B
4747′	1″	—No. 1 C&B		PLAIN OAK	
2137′	1″	—No. 2 Com.	9869′	1″	—No. 1 C&B
	ROCK ELM		1107′	2″	—No. 1 C&B
12493′	2″	—No. 1 C&B			

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Ply Wood Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS FIR DOOR PANELS

Write us for our Stock and Price List

Southern Hardwoods

GUM - POPLAR - OAK

We take a just pride in turning out the very best lumber for the manufacture of high grade furniture.

A modern mill, experienced operators and rigid grading of the finished lumber is your guarantee of assured satisfaction.

Test Our Service

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY Memphis - Tennessee SERVICE

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

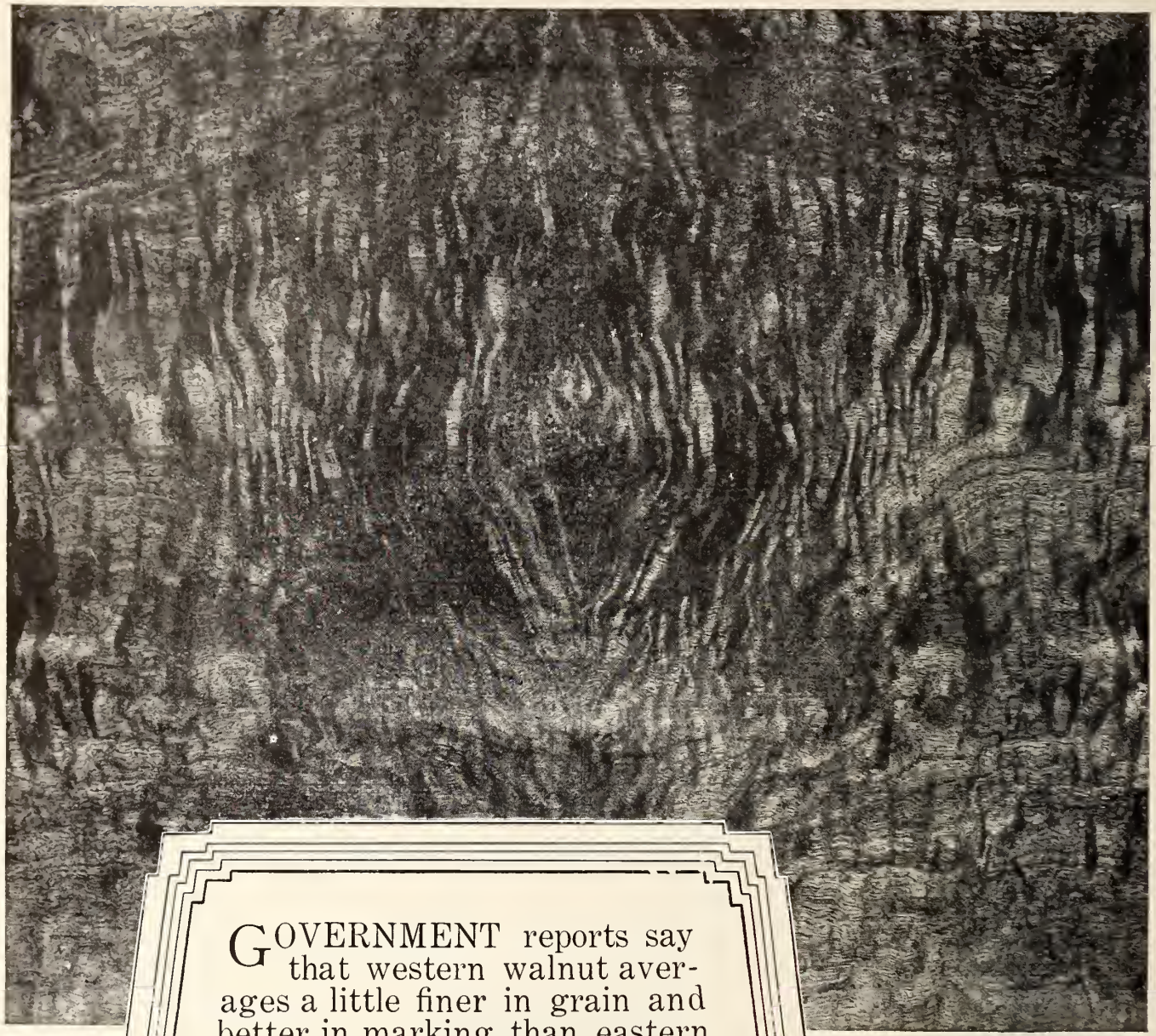
Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO



GOVERNMENT reports say that western walnut averages a little finer in grain and better in marking than eastern walnut—and that walnut grown in Iowa is a little better on the average than other western walnuts. Buyers for some of America's leading cabinet makers confirm this statement.

Let us quote you on your needs in Walnut Lumber and Veneers. Some especially good values now.

IOWA WALNUT

Des Moines Sawmill Company

Des Moines, Iowa

Des Moines Sawmill Co.
Des Moines, Iowa

Please quote us on:

.....

.....

.....

.....

.....

Name .....

.....

Address .....

.....

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

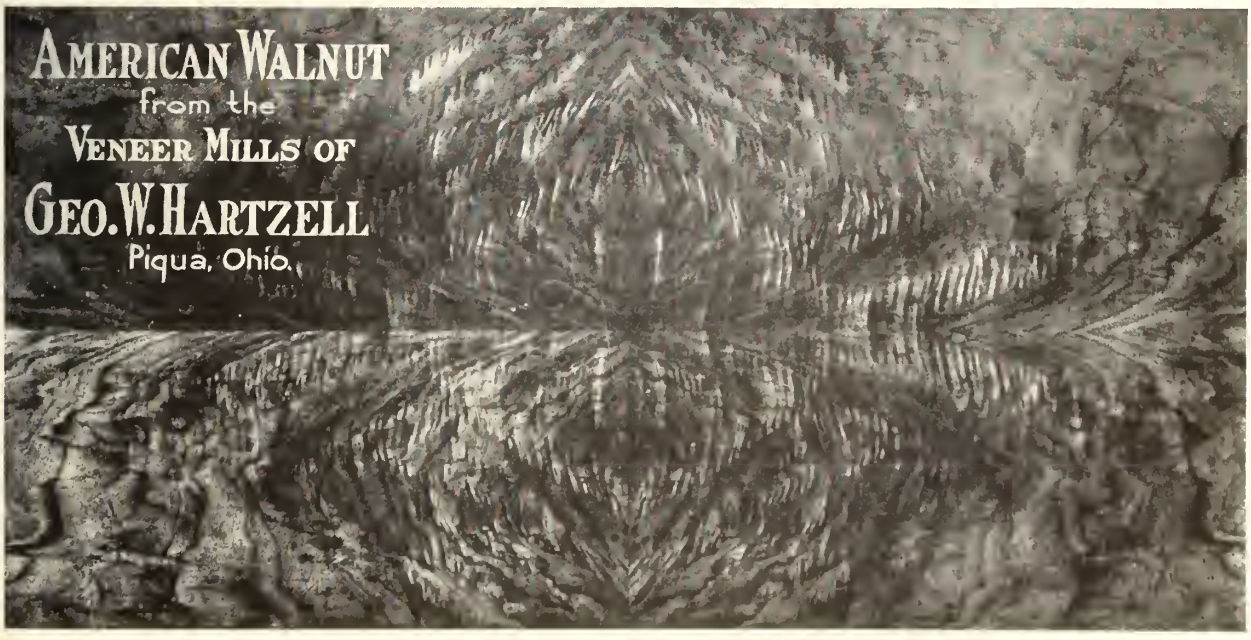
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

OAK

Plain and Quartered

Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manu facture.

Oak Timbers and Planking

The **Mowbray & Robinson Co.**
(INCORPORATED)

Manufacturers

Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative:
A. K. Johnson, Traders Bank Building, Toronto, Ont

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment

All grades and thicknesses

Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

E L M M A P L E

FOR SALE RUSH LUMBER COMPANY FOR SALE

QTD. WHITE OAK			Sound Wormy	25,000′
4-4	F. A. S.	2,000′	4-4 No. 3 Com.	70,000′
4-4	F. A. S. 10″ & up	1,000′	5-4 F. A. S.	2,000′
4-4	No. 1 Com.	15,000′	5-4 No. 2 Com.	13,000′
4-4	No. 2 Com.	15,000′	6-4 No. 1 Com.	2,000′
5-4	F. A. S.	14,000′	PLAIN RED OAK	
5-4	No. 1 Com.	8,000′	3-4 No. 1 & 2 Com.	70,000′
5-4	No. 2 Com.	4,000′	4-4 F. A. S.	2,000′
6-4	No. 1 Com.	30,000′	4-4 No. 1 Com.	10,000′
6-4	No. 2 Com.	20,000′	4-4 No. 2 Com.	20,000′
8-4	F. A. S.	5,000′	5-4 F. A. S.	7,000′
8-4	No. 1 Com.	3,000′	5-4 No. 1 Com.	15,000′
PLAIN WHITE OAK			5-4 No. 2 Com.	3,000′
4-4	No. 1 Com.	5,000′	QTD. RED GUM	
4-4	No. 2 Com	8,000′	4-4 F. A. S.	7,000′

G U M O A K

4-4	No. 1 Com.	13,000′	POPLAR	
5-4	F. A. S.	2,000′	4-4 No. 2 A Com.	25,000′
6-4	F. A. S.	3,000′	4-4 No. 2 B Com.	35,000′
6-4	No. 1 Com.	14,000′	5-4 Sel. & Bet.	9,000′
RED GUM S. N. D.			5-4 Saps	3,000′
8-4	No. 1 C&B.	70,000′	5-4 No. 1 Com.	12,000′
10-4	No. 1 C&B.	40,000′	5-4 No. 2 A Com.	8,000′
SAP GUM			6-4 Sel. & Bet.	7,000′
5-8	No. 2 Com.	7,000′	6-4 No. 2 Com.	12,000′
5-4	F. A. S.	1,000′	8-4 Sel.	3,500′
5-4	F.A.S. 13″ & Up	4,000′	8-4 Sap	8,000′
5-4	No. 1 Com.	9,000′	8-4 No. 1 Com.	3,000′
6-4	F. A. S.	11,000′	MISCELLANEOUS	
6-4	No. 1 Com.	6,000′	4-4 L. R. Qtd. B. Gum	25,000′
6-4	No. 2 Com.	4,000′	4-4 L. R. Pln. B. Gum	25,000′

A S H P O P L A R

MEMPHIS, TENN.

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

Sawed Veneer

Quartered White Oak

For Furniture and Panels

Plain Red Oak

For Interior Trim and Doors

Cypress

For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.

MEMPHIS, TENN.

McDonagh Lumber Co.

203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods

Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

Calhoun Plywood Company

Panels Tops Counter Fronts

OPERA CHAIRS
in the White or finished.

Vegetable or Waterproof Glue.

Sheboygan - Wisconsin

WAYNE LUMBER CO.

Manufacturers and Wholesalers

American and Canadian
Hardwoods

Birch and Maple—Our Specialty

Special items we want to move:
1 car 2″ Basswood Log Run
Soft Elm, 70,000′ 1″ Log Run, 70,000′ 2″
Soft Elm, 24,000′ 3″ Log Run
1″ Maple 1 car 1″ No. 1 Common
1″ Maple 1 car 1″ No. 2 Common
1 car 5/4 No. 2 Com. Maple
2 cars 2″ No. 1 Com. & No. 2 Com. Maple

110 West 40th St. New York

Canadian Representative,
D. Cote, 871A Durocher St. Outremont, Montreal

BEDNA YOUNG
Lumber Company

Jackson - Tennessee

Manufacturer of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for

High Grade Lumber

please let us have your enquiries.

HARDWOOD LUMBER

'A Quality you will admire"

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Kiln Dried Products

Our kiln at Owensboro is a thoroughly modern equipment for handling green or dry lumber with efficiency and entire satisfaction.

Our facilities enable us to give real service—straight or mixed carloads.

Try our soft textured and finely figured quartered-sawn red and white oak. It will please you.

J. V. Stimson & Company

OWENSBORO - KENTUCKY

Bandmills Owensboro; Campbellsville, Kentucky

DIMENSION

On hand for immediate shipment

Clear Red Gum Squares	1 car	2½ x 2½-30″	D
	1 car	2 x 2 -30″	D
Clear Sap Gum Squares	3 cars	2½ x 2½-30″	D
	3 cars	2 x 2 -30″	D
	1 car	2 x 2 -19″	D
	1 car	1½ x 1½-19″	D
	1 car	2 x 2 & 2½ x 2½-19″	D
Clear White and Red Oak	1 car	2 x 2 -30″	D
Clear Ash	1 car	1¾ x 1¾ & 2 x 2-30-44-50″	
	1 car	1-5/8 x 1-5/8-19-38″	
	1 car	1-5/8 x 1-5/8-36-40″	
	1 car	2½ x 2½-30″	
Oak Auto Bow Strips	1 car	1-1/8 x 1-5/8-7′, 7′ 6″ 1 x 1-½-7′, 7′ 6″	
Ash and Elm	1 car	2 x 2-½-48″	

HARDWOOD LUMBER

1 car 5/4 No. 1 Com. & Btr. Qrtd. Red gum.
1 car 4/4 FAS Plain Sap gum.
3 cars 4/4 No. 1 Common Plain Sap gum.
1 car 5/4 No. 1 Common Plain Sap gum.
2 cars 6/4 No. 1 Common Plain Sap gum.
1 car 4/4 No. 1 Com. & Btr. Plain White and Red Oak
1 car 4/4 No. 1 Common Plain Red Oak
2 cars 4/4 FAS Cottonwood
1 car 4/4 FAS Tupelo
1 car 14/4 Log Run Soft Elm.
2 cars 6/4 No. 1 & 2 Common Qrtd. White Oak.

We can furnish your requirements in square or flat dimension. Let us have your specifications.

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office Dimension Mill & Yard
Belt Line at McLean.

MEMPHIS - TENN.

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated

General Office, NEW ORLEANS, U.S.A

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn
Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

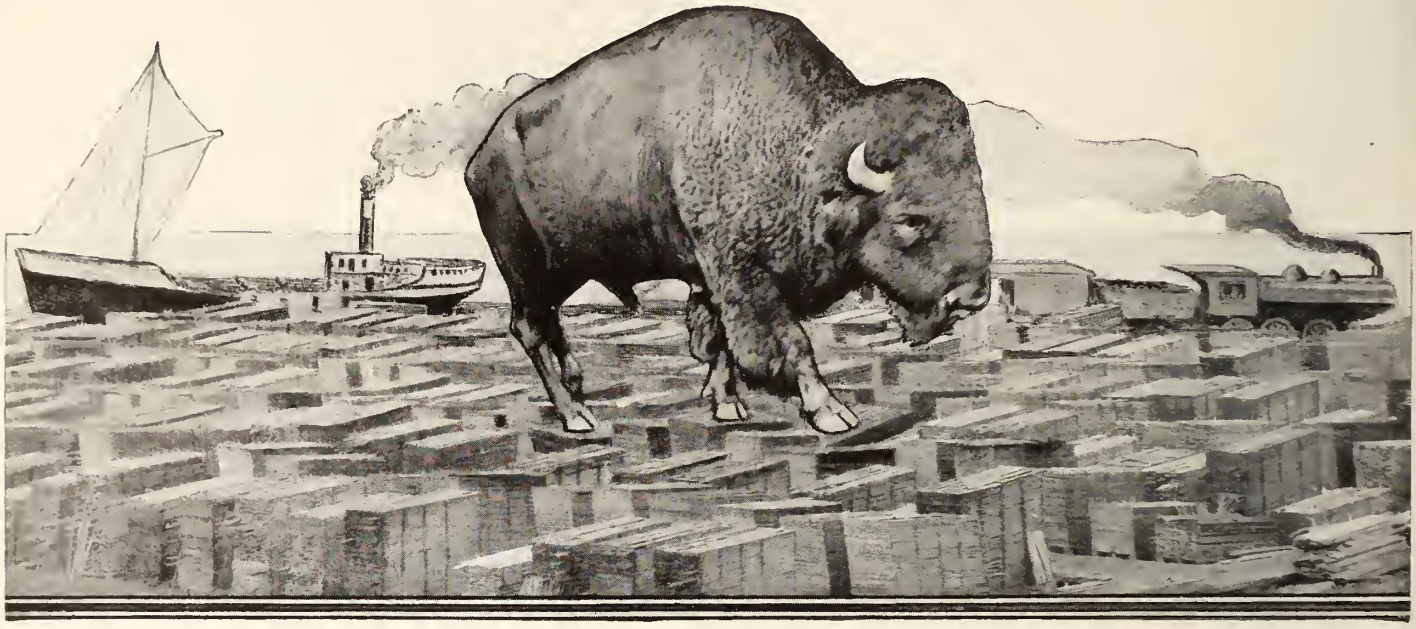
A few Specials :

130,000 ft. 4/4" No. 1 and No. 2 Common Qtrd. White Oak
65,000 ft. 4/4" No. 1 and No. 2 Common Plain White Oak
100,000 ft. 4/4" No. 1 and No. 2 Common Poplar

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Buffalo for Hardwoods



"LET BUFFALO DO IT"

Buy and Sell Your Hardwoods in Buffalo

Do you want prompt shipment? We can give you service. Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.

Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

Frank T. Sullivan
Specialities:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
Northern Grey Elm
and
Brown Ash
Niagara Street Cornor Arthur

ATLANTIC LUMBER COMPANY
HARDWOODS
West Virginia Soft Red and White Oak
Our Speciality: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller, Sturm & Miller
1142 Seneca Street
Hardwoods of All Kinds

YEAGER LUMBER CO., Inc.
SPECIALITIES
Oak, Poplar, Ash, Maple
932 Elk Street.

STANDARD HARDWOOD LUMBER COMPANY
HARDWOODS
Prompt Shipment { From Buffalo Yards or from mill direct to you
8 Million Feet Dry Stock on hand
1333 Clinton St.

G. Elias & BRO., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and fir timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B WALL Pres. T. H. WALL Vice-Pr.
M. M. WALL, Treasurer
940 SENECA ST.
We Specialize in White Ash, Oak, Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

HUGH McLEAN LUMBER CO.
Hardwoods of all Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

TAYLOR & CRATE
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

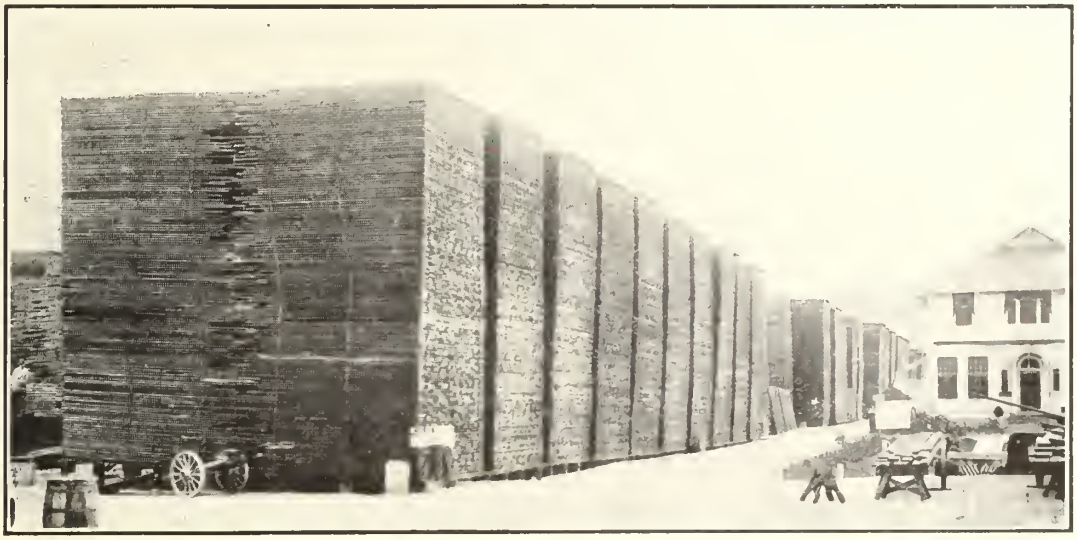
OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY



Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

Specialty E C & S Birch

Efficiency Courtesy and Service

Beautiful Birch

American Manufacturers use Canadian Birch

Supplied by Edward Clark & Sons, Limited

FOR years now furniture manufacturers of the New England and Middle Western States have looked to us for their supplies of Canadian Birch.

Year after year these makers continue to come to us. New customers have been added from time to time, of course.

It is only natural, therefore, that our sales of this beautiful wood should have steadily increased, as its fine and uniform quality, richness of grain and economical cost have become better known and recognized.

To buy Birch from Edward Clark & Sons is to be assured of generous grading, prompt shipments and helpful, courteous service.

This stock will work up with a minimum of waste resulting in lower costs. Send in an order today for a trial car and judge for yourself.

Edward Clark & Sons, Ltd.
807-809 Bank of Hamilton Bldg.
TORONTO

By courtesy of Hubbard, Eldridge and Miller, Rochester, New York.

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES - that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

Lumber

Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers

Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 38 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut
Mahogany, Teak, Oak
Ash, Cypress

ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

The McLennan Lumber Co.
Limited

MONTREAL

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co.
Orillia, Ontario

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.—58,000
1¼ in.— 3,500
1½ in.—

CHERRY

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
1 in.	44,500	.....	203,900	18,500
1¼ in	4,900	.....	37,600	7,500
1½ in.	2,000	.....	34,700	36,300
2 in.	6,000	.....	22,200	61,900
2½ in.	5,500	.....	4,300	2,200
3 in.	25,700	.....	6,500	3,300
4 in.	4,000	.....	900	400

CHESTNUT

	1 & 2	Clear Strips.	No. 1 Com.	S.W. & No. 2 Com.
¾ in.	500	.....	56,000	91,000
1 in.	11,000	500	45,000	1,000
1¼ in.	66,800	300	100,200	159,200
1½ in.	34,500	.....	40,000	.....
2 in.	2,200	.....	15,300	89,200
2½ in.	4,000	.....	1,500	.....
3 in.	1,100	.....	1,000	500
4 in.	1,500	.....	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
½ in.	6,500	.....	.....	.....
¾ in.	900	300	23,600	9,000
⅝ in.	2,800	.....	5,500	800
1 in.	17,300	10,000	52,400	27,000
1¼ in.	5,000	.....	6,000	.....
1½ in.	600	.....	2,400	.....
2 in.	.....	.....	25,100	5,700
2½ in.	2,000	.....	400	.....
3 in.	2,000	.....	1,300	.....
4 in.	2,500	.....	1,700	.....

PLAIN WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	1,000	.....	.....	.....
½ in.	100	.....	.....	.....
⅝ in.	2,150	.....	8,000	16,900
¾ in.	274,800	.....	453,800	122,000
1 in.	42,300	1,700	78,000	85,200
1¼ in.	6,300	.....	15,100	.....
1½ in.	51,300	.....	84,000	12,000
2 in.	29,000	.....	125,000	54,000
2½ in.	152,800	.....	69,500	3,000
3 in.	55,800	.....	75,800	14,400
3½ in.	4,500	.....	4,000	1,500
4 in.	65,000	.....	38,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	24,200	.....	.....	.....
¾ in.	170,000	.....	327,000	65,800
⅝ in.	2,400	.....	77,000	42,600
1 in.	30,200	3,150	56,000	125,400
1¼ in.	11,700	2,400	16,600	.....
1½ in.	138,900	4,300	46,200	32,000
2 in.	91,500	.....	162,000	71,000
2½ in.	70,100	.....	26,000	3,700
3 in.	23,800	.....	20,500	7,000
4 in.	16,600	.....	10,900	.....

QUARTERED RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
¾ in.	1,700	.....	9,700	500
1 in.	10,200	5,400	7,500	1,400
1¼ in.	2,000	.....	.....	.....
1½ in.	.....	.....	.....	.....
2 in.	.....	.....	7,400	.....

SAP GUM

	1 & 2	Strips.	No. 1 Com.	No. 2 Com.
1 in.	.....	16,000	21,000	.....
1¼ in.	.....	.....	.....	.....
1½ in.	.....	2,400	6,000	13,500
2 in.	.....	.....	5,700	10,400
2½ in.	.....	.....	.....	.....

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	20,000	9,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

	1 & 2	No. 1 Com.	No. 2 Com.
1 in.	.....	16,300	10,900	9,500
1¼ in.	.....	6'000	8,325	.....
1½ in.	.....	12,000	13,300	9,500
2 in.	.....	9,000	3,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	2,000	6,000	7,000
5/4	9,400	10,800	.....
6/4	8,900	5,500	4,600
8/4	1,300	19,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No.2 Com.
⅝ in.	18,000	15,800	31,300	800
1 in.	27,000	5,200	91,900	.....
1¼ in.	22,300	360	5,700	6,000
1½ in.	19,100	13,000	29,000	7,500
2 in.	15,000	.....	10,500	24,500
2½ in.	10,800	6,000	.....	.....
3 in.	17,900	.....	11,400	47,000
4 in.	6,500	.....	300	450

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

We have MILLIONS of Feet

of AMERICAN Walnut Veneers
Longwood and Choice Butts

of FIGURED Mahogany Veneers
For the FURNITURE PIANO and WOOD-WORKING TRADE

Plain Veneers for Drawer Bottoms

Also a Complete Stock of
MAHOGANY LUMBER
Ready for Prompt Shipment

of POPLAR Gum and Oak Veneers

We have been supplying the Furniture Trade and allied industries since 1843, with material direct from stump to consumer.

Our stock is A-No. 1 for quality and all orders are executed promptly and accurately.

LEWIS THOMPSON & CO., Inc. Offices: 49th and Botanic Ave., Phild.
Yards: New Orleans, Phild., New York

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

Mills: Coal Grove, Ohio
General Offices: 33 Rector St. New York City

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

ASH
OAK
GUM
CYPRESS
TUPFLO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

OUR EXPORT BRAND

Service **LHC** *Quality*

Prompt *Shipment*

SPECIAL
Plain White Oak
50 M' 1" FAS
30 M' 1¼" FAS
12 M' 1½" FAS
15 M' 2" FAS

SPECIAL
Plain White Oak
70 M' 1" No.1 C&S
20 M' 1¼" No.1 C&S
20 M' 1½" No.1 C&S
15 M' 2" No.1 C&S

GUM
ASH
OAK
POPLAR
CHESTNUT

LIVERPOOL HARDWOOD COMPANY Inc.

50 Church St. NEW YORK CITY
Bank of Commerce Bldg. MEMPHIS, TENN.

Ash Poplar Cypress

HAFNER

MANUFACTURING COMPANY

Do you know that our service to you includes the shipment of mixed cars from our St. Louis Yards and that we can include all items of Southern Hardwoods, Cypress or Yellow Pine Finish.

ST. LOUIS, MO., U.S.A.

E S T A B L I S H E D 1 8 7 1

Oak Red Gum

Why Bruce Hardwoods Excel

For many years before we became hardwood lumber manufacturers, we were makers of fine Oak Flooring and are to-day the largest individual producers of that material.

The producing of good Oak Flooring is an exacting science—where perfection is attained—and teaches the value of both skilful grading of raw material and accuracy in milling.

With a full appreciation of the value of these factors, we entered also upon the manufacture of southern hardwoods and in the operation of this department, have applied them in the production of all items in white and red oak, gum, ash and other species.

With our joint facilities, we are equipped to ship square edge parquetry strips, oak trim and mouldings, as well as Oak Flooring in the same car with hardwood lumber.

Inquiry and correspondence invited.

E. L. BRUCE COMPANY
MANUFACTURERS
MEMPHIS, TENN.

Band Mill: Little Rock
Oak Flooring Plants: Memphis; Little Rock

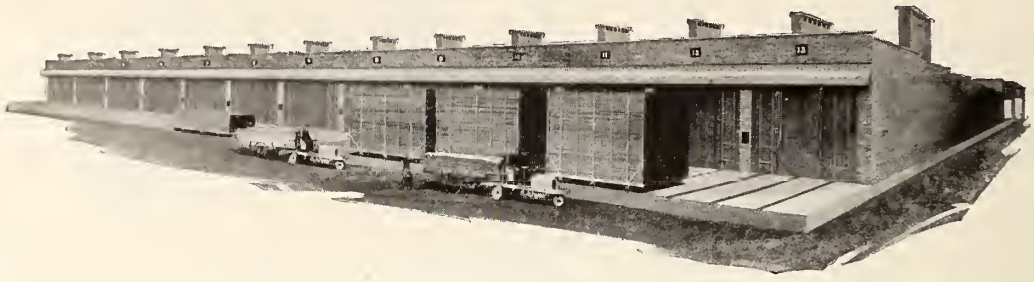
Walnut
Oak
Poplar
Chestnut
Gum
Ash

Will Ship High Class Stock and Make Prompt Shipment.

Leland G. Banning
Cincinnati, Ohio

Canadian Representative:
A. E. Klippert, 11 Laxton Ave
Toronto

KILN DRIED HARDWOODS



Kiln capacity 3,000,000 ft. monthly

WEST VIRGINIA
OAK
CHESTNUT
WHITEWOOD
BIRCH
HICKORY

We earnestly solicit your inquiries

AROMATIC RED CEDAR

ARKANSAS
RED GUM
SAP GUM
OAK
ASH
ELM

The M. B. Farrin Lumber Co.

CINCINNATI, OHIO

Dependable Shippers of American Hardwoods

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED
1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars

All Canadian and American Hardwoods
Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

EASTERN BRANCH—38 GREY NUN STREET, MONTREAL

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO
Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.
Subscription, $2.00 a year; foreign, $2.50.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 Toronto, May, 1922 No. 5

Per Capita Furniture Expenditure Low

Why is the per capita expenditure for furniture in Canada lower than that in the United States? Figures recently issued, covering the American furniture industry, give as the total value of the furniture produced in 1919 a figure slightly in excess of $575,000,000. Estimating the population of the States at 115,000,000, this gives a per capita expenditure of $5.00 for each man, woman and child.

In Canada the total value of the furniture produced in the same year was in the neighborhood of $25,000,000., which, based on a population of 9,000,000, figures out in the neighborhood of $2.80 for each man, woman and child, or slightly in excess of 50% of the American per capita furniture expenditure. This goes to show what a wonderful opportunity the Canadian furniture manufacturers have for educational and publicity work. If through an extended educational campaign they were able to bring the per capita expenditure up to $5.00, it would practically mean doubling the output of all our factories.

When one considers that the claim has been made that a three-years' publicity campaign would double the American per capita expenditure for furniture, it makes one wonder just what the Canadian furniture manufacturers could accomplish if they went about it aggressively and persistently.

The Basis of Intelligent Competition

In commenting on the ideas of woodworking costs held by different woodworkers, one prominent manufacturer suggests that part, at least, of the wide discrepancy which exists in quotations secured from various sources, is due to the fact that sufficient particulars are not given when prices are being sought. A rough sketch is handed to a woodworker and he is asked to figure on it. Information as to details of construction is lacking, with the result that one manufacturer figures one way while another may figure from an entirely different angle. This means that while both quotations were based on the same sketch, yet they were not based on the same work. The point is well taken, for unless a woodworker knows every detail of the job on which he is figuring, he is not in a position to give a definite figure, yet is often called upon to do so and that in the face of keen competition. This leads up to the suggestion that if architects and others, when asking for estimates on millwork of any kind, were to give full particulars as to how the work is to be done, the woods used and the details of construction, there would not be such a wide difference in the estimates received.

The following quotation from a letter by C. B. Harman, of the Southern Sash, Door and Millwork Manufacturers Association, deals with this very subject:

> "A short time ago one of our members took an order for a mantel and as it was of very special design he was unable to figure the cost intelligently or safely, and booked the order on a cost plus, basis. Special moulding was required and a lot of tedious mitre work and so on. He made a charge of $40. The customer kicked on the price, saying that his contractor said he could get it made for less than half that price.
>
> "The customer then called on another local plant who made a price of $25 and another made a figure of $17.
>
> "I have the pencil drawing on my desk and without further information I can't see how any one could either safely make the mantel or a price for it, for the drawing certainly does not show what is wanted, either for size or detail.
>
> "I haven't seen the cost figures and don't know if our member's price of $40.00 is fair and proper, but granting that it is, what is the result? He has made the mantel and knows what it has cost, while several other factories take a guess at the cost. The customer naturally feels that the $17.00 figure should be the basis of settlement."

This naturally brings up the question of why woodworkers should be left to figure out the details of any job and left to draw up their own bills of material. Would it not be much more satisfactory from every point of view if, for instance, when an architect calls for figures for the millwork of a house, he would accompany such request with not only a sketch of place but with a bill of the material required. In this way all who are asked to tender would be figuring on exactly the same material. As it is now, one estimator takes off the quantities from the plans and specifications, but certain items are omitted, perhaps intentionally or again it may be unintentionally, but in any event it is only natural that his figure should be lower than those included all items in their estimate. If the party figuring low, receives the job, the architect or owner pays more in the long run, for all items omitted are charged up as "extras."

This condition has been overcome in certain sections of the United States by the formation of Associations or by independent organizations which take a plan or other order for millwork and draw up a uniform bill of material which is submitted to all who desire to tender on the work. When this is done, any fluctuation in the figures presented can be compared, for all quotations are based on the same material list.

Canada's First "Furniture Week" a Success

Windsor Retail Dealers Co-operate with Home Furnishings Bureau and Stage Interest Arousing Week—Satisfactory Volume of Business Results —Suggests New Line of Activity for Bureau

The week of April 24th-29th witnessed an innovation as far as furniture merchandising methods in Canada were concerned. This took the form of a Furniture Week, and was staged by the furniture dealers of Windsor, Ont., acting in close co-operation with the Home Furnishings Bureau, or perhaps, it would be more correct to say, acting on a suggestion from the Home Furnishings Bureau.

The idea was in reality to get as much publicity for and create an increased interest in furniture and home furnishings through increased advertising, special store and window displays, talks on home furnishing and color schemes, and in many other ways to focus attention on furniture and better furnished homes. The scheme was welcomed by the Windsor furniture dealers, who worked together in closest harmony, and, in addition, various public-spirited organizations took an active interest in making the week an outstanding event.

How the Scheme was Developed

This special week did not take the form of a centralized display, such as was staged in Detroit recently, but consisted largely of unusually attractive exhibits on the part of each individual dealer. Arrangements were made whereby each retailer undertook to change his window display every other day, giving 52 changes during the week. A schedule was drawn up so that there was not any duplication of window exhibits. In addition, every effort was made to have the furniture on the floors of each store arranged in an attractive manner so that each piece was shown to the best advantage. The windows contained attractive cards inviting the public to come in and look around; in fact this was the tenor of the advertising conducted by the retail dealers throughout the whole week. Instead of attempting to sell furniture in their newspaper space, they featured the home and extended a cordial invitation to the public to see their displays.

A feature of the week, which proved of considerable value, was a lecture and demonstration by John Crooks Gordon, instructor of Decorative Art at the Toronto Technical School. This followed closely the methods adopted with so much success by J. Ross Crane, of the Chicago Art Institute. During the course of his talk, Mr. Gordon furnished a living room on the stage, arranging suitable furniture supplied by Windsor dealers, to the best advantage, and explaining why each piece was selected and its place in the general scheme. At the same time he defined the basic principles upon which decorative color schemes are built and demonstrated his remarks by working out an attractive color scheme in full view of the audience. Mr. Gordon's talk was well received and at the close of his address, the ladies literally swarmed on the platform to ply him with questions pertaining to their own particular problems.

The younger generations were not overlooked. Pieces of furniture made by the pupils of several manual training classes were selected and judged, the judges being J. H. Baetz and F.E. Coombe, and prizes awarded to those responsible for the articles which showed the greatest originality in design as well as skill in the making and finishing.

Results all that were Expected

The result of this concentrated effort was that for a considerable period preceding the furniture week and during the week itself, furniture and home furnishings were a common topic of conversation. The housewife viewed her rooms with an unusually critical eye and resolved to make improvements here and there. During the week the displays were on, crowds of people visited the retail section for the sole purpose of seeing the furniture exhibits. Many who came to examine, remained to buy, while others came with a definite intention of improving the furnishings of their home or some particular room. From the viewpoint of sales alone, this week was a success and was well worth all time, effort and money expended. For the full six days the furniture dealers were extremely busy, many nice sales being recorded; in fact the demand for furniture was such that several retailers were forced to hire extra trucks to take care of their deliveries. The end is not yet, for the interest and enthusiasm thus aroused will not subside in a day, but will result in new sales for weeks and months to come.

From the viewpoint of the furniture manufacturer it is not an exaggeration to say that this was one of the most effective publicity and sales-building schemes ever inaugurated by the Home Furnishings Bureau and at such a small cost. For, an expenditure of a few hundred dollars for travelling, organization and advertising, the following publicity was obtained for the products of the furniture factories:— Three to five pages in each issue of the local papers devoted to furniture advertising and interesting and instructive articles dealing with furniture design, period furniture and various phases of home decorations; editorials on the home and its furnishings; sermons from different pulpits dealing with the influence of the home and why it should be made as attractive as possible, and desirable publicity of many other kinds. What is perhaps more to the point, a satisfactory quantity of furniture was sold and a market created which will absorb considerably more.

Will Have Permanent Effect

In addition to this, the retailers were brought closer together and made to realize what can be accomplished through co-operative effort, and at the same time were brought into closer touch with furniture manufacturers through the Home Furnishings Bureau and through the furniture makers who were in attendance. Another lesson learned by the dealers was that much can be accomplished through making their store and window displays as attractive as possible and changing their windows at frequent intervals. All this means increased furniture sales and a more united industry through years to come.

In view of all that was accomplished at Windsor

at such a small cost, would it not be advisable for furniture manufacturers working through the Home Furnishings Bureau, to make an organized effort at promoting Furniture Weeks at various centres? An organization could easily be developed which through time would be able to direct and promote special weeks of this kind in all the principal cities of Canada. The scheme may be an ambitious one but it is not impossible of accomplishment, and the results would more than justify the expenditure and effort involved.

Bending Southern Oak Chair Posts in Hot-plate Bender

Effect of Initial Moisture Content of Stock—Reducing Loss from Surface Checking—Moisture in Steam Chamber does not Reach Centre of Wood during Steaming Operations

By W. K. Loughborough*

From a technical standpoint, steam bending of wood has been and doubtless will continue to be a problem of great interest. It has a very practical significance for the manufacturers of chairs, vehicles, and barrels.

The chair manufacturers, moreover, have complicated their bending problem by the introduction of the hot-plate bender, the plates of which are heated with high-pressure live steam. This process fits in well with commercial requirements as it is much faster than the old hand-bending method. It seems to have been well demonstrated, however, that the slower process of hand bending does not cause so great a loss of material as the more rapid hot-plate bender process does. A loss of as much as 50 per cent in hot-plate bending is not uncommon. This is additional to the loss of material in the boards which are rejected because of unfitness for making chair posts. At one plant it was found that out of a thousand feet of oak chair post stock from the yard only 700 feet were fit for bending, and ultimately only about 300 feet were used in the finished chairs.

Need for Using Southern Oak

The problem of the chair manufacturers is made more acute by the fact that the supply of the more easily bent northern oak is rapidly becoming exhausted. The price of this class of material is also rapidly increasing, and the industries manufacturing the medium and cheaper grades of chairs are forced to use northern oak sparingly. Consequently there seems to be a growing tendency on the part of the chair manufacturers to use the cheaper southern swamp oaks.

Probably within ten years, at the present rate of consumption, the chair industry will be facing a crisis because of a lack of northern oak. For this reason the bending problem of the chair manufacturers is deserving of careful attention, and any discoveries will be welcomed that trend to conserve the supply of suitable bending material. This will be the result if information gained should justify the use of the cheaper southern woods which have hitherto been bent only with heavy losses.

Experiments in Steam Bending

As practically no data was available on the subject of steam bending, a co-operative project was arranged by the Forest Products Laboratory of the Forest Service with the Crocker Chair Company of Sheboygan, Wisconsin, to obtain, if possible, information that would tend to reduce bending losses to a minimum. The experiments were made in the company's bending room with commercial equipment and material. Some more or less concrete information was obtained concerning (1) moisture content of stock before steaming, (2) length of steaming period at different atmospheric pressures, and (3) how stock could best be dried after bending.

Description of Equipment Used

The machine used in these tests was a typical steam bender. It is built with seven hollow-formed steam plates. A 12-in. hydraulic cylinder forced these plates together, thus bending the material into the spaces between them. Straps of wide metal, on the ends of which angle irons are riveted, are used in each space between the plates. In these straps the posts are bent and dried. The openings are always loaded and material bent before another space is opened. The plates are provided with locking devices which permit the loading or unloading of a particular opening without interfering with the material in the other openings. The steam connections between the plates consist of swing joints which permit the plates to slide up and down on the end posts of the machine.

The three lowest plates of the machine, forming two openings, were used exclusively in these experiments. This equipment gave perfect control of the heat in the plates. With a pressure of 7 pounds on the bending machine, a maximum thermometer, the bulb of which was placed midway between the two plates, registered 212 degrees Fahrenheit; at 20 pounds pressure the temperature was slightly outside of the range of the thermometer but was estimated at between 225 degrees and 230 degrees; at 55 pound pressure the temperature between the plates was not even approximately estimated.

Kind of Material Used

The steaming was done at atmospheric pressure in a concrete steaming box about 3 feet wide, 6 feet high, and 10 feet long. Exhaust from the engines was passed through a water heater and then delivered to the steaming bores. It is, therefore, clear that the steam was saturated if not supersaturated before it left the heater. Numerous tests showed that the temperature in the steaming box was practically constant at 211 degrees.

The material used in these experiments was that commercially known as oak tie stock, that is, the side

*Assistant Engineer, Forest Products Laboratory, Madison, Wis.

lumber left in the manufacture of oak ties, and it was obtained from the company's yard. It was known to be southern oak, with the red and white species represented in about equal proportions.

The material was an inch thick, and as it was cut from the outside of the log, a large portion of the board was tangential or nearly tangential. Almost the entire board could be sawed into 2 inch strips having a radial or semi-radial edge, and the length was 39 inches. It was run through the sticker and surfaced on two edges. The chair posts were brought to the bending room and trimmed to length. The selected material was then put in the steaming box or retort and finally bent in the hot-plate bender.

The general scheme of the study was to group different variables so that one variable could be isolated and studied. The moisture content of the stock before steaming was considered the most important variable, and three percentages of moisture were selected: (1) 12 to 15 per cent., (2) 25 per cent., (3) 40 per cent. Thirty identical tests were made with each of the moisture classes, and these tests involved approximately 4,000 southern oak chair posts.

Humidification of the Plates

When one watches the hot-plate bending machine work, he gets the impression that the very high temperature and low humidities used in the plates must cause considerably more surface checking than would be produced by more conservative drying conditions.

An attempt was made to control the amount of surface checking somewhat by raising the humidity. The first method used was that of placing a thick, water-saturated, wool pad between the posts and the hot plates. In the earlier experiments a pad was placed on top and one beneath the posts so that no portion of the post came in direct contact with the hot-plate bender. As duel tests showed that the employment of these two pads did not change the results obtained by the use of the lower pad alone, the use of the upper pad was discontinued.

The reduction of the temperature in the steam plates was the only variable tried that showed a consistent reduction of surface checks; however, the time required to bend and dry the material was increased. To raise the humidity in the plate high enough to reduce surface checking is equivalent to depriving the present hot-plate bending machine of its only redeeming quality, namely, its speed of production. The tests, therefore, were not satisfactory in the direction of perfecting some system which would minimize the surface checking.

Bending Material While Hot and Moist

At the outset of the study it was noted that, to obtain the least amount of tension failures, the stock should be bent as soon as possible after being taken out of the steaming box. If 18 minutes intervened before bending, the stock seemed to have lost nearly all of its plasticity. As the intervening time was reduced, there was a consistent decrease in the percentage of rejections due to tension failures. In fact, if posts were bent within two minutes after they were taken from the steam box, the loss was practically the same, whether the posts were bent on a wet pad or not. The results of the experiments with the use of the wet pad indicated that for successful bending the tension surface should be moist and hot when the stock is bent.

The purpose of steaming is to soften the wood that is being bent so that the deformation can take place with the minimum amount of stress. The softening must be in proportion to the amount of deformation required.

The degree of plasticity varies both with the temperature and with the relative humidity of the air applied. Woodfibers become more plastic when steamed in saturated air at relatively high temperatures —180 degrees to 212 degrees for example—than when treated in air at 120 degrees and 100 per cent. humidity, or in air having a lower relative humidity at either high or low temperature, or when soaked in cold water.

As moisture penetrates wood very slowly, the moisture which is absorbed during a practical steaming period can not reach the inner fibers to soften them. It is largely the self-contained moisture that is effective in softening the inner fibers when a sufficient degree of heat is applied. If the bend tends appreciably to distort the central part of the stick then that part must be made plastic by a high percentage of self-contained moisture when steamed. Up to the fiber-saturation point the percentage of moisture the stick must contain is in proportion to the severity of the bend. The chair-post bend is ordinarily so mild that a high degree of plasticity is not required in the center, and consequently it is not necessary that the stock contain a high percentage of moisture.

The optimum steaming period preparatory to bending seems to vary with the percentage of moisture which the stock contains at the time it is steamed. If the moisture content is low, a long steaming treatment seems to be more beneficial in reducing tension failures than if the moisture content of the stock is high. If the stock contains 15 per cent. moisture or less, the preparatory steaming period may with benefit extend to an hour.

If the wood contains 25 per cent. moisture, it was observed that following a half hour steaming period there was only 2 per cent. more rejection from tension failure than resulted after stock that contained 12 to 15 per cent. moisture was steamed three hours. Obviously, the higher percentage of moisture a stick contains the more tendency there is to shrink as it dries. If a stick is dried in a hot-plate bender, its surface quickly becomes set and hardened, and shrinkage in cross section is almost entirely prevented. Severe drying conditions make surface checking and honey combing inevitable if the stock contains much moisture.

(Continued in the June issue)

Table Manufacturers Unite

A new organization known as the National Association of Table Manufacturers, was formed recently through a merger of the Central Bureau of Dining Table Manufacturers and the Association of Living Room Table Manufacturers. It is likely that this organization will be extended to include manufacturers of library and kitchen tables. This merger is a result of the tendency shown during recent years for manufacturers of tables to pull away from specialization and to increase the diversity of their lines. The tendency seems to have been towards making entire suites rather than specializating in one type of table. For this reason it was felt that the interests of these manufacturers could best be served through a central organization rather than through individual associations.

Systematizing the Furniture Factory

The Success of a Woodworking Project Often Depends as Much Upon System and Organization as Upon Equipment and Product—How Office Specialty Manufacturing Co. Follow Orders Through—Daily Reports Show Movement of Work From Department to Department

By L. R. Wright

The article in the April "Canadian Woodworker and Furniture Manufacturer," describing the lumber recording system of the Office Specialty Mfg. Co., Limited, Newmarket, Ont., contained so much of interest and value that it is with a feeling of gratification that we are able to present to our readers another article dealing with the system used in the same plant to facilitate the movement of work through their woodworking factory. Here, as in the case of lumber, close check is kept on all the orders going through and on every phase of the work.

All orders are prepared in the main office and reach the wood superintendent in the form of a "wood order," Fig. 1. Sufficient copies of this order are made to give one to each department through which the work will pass. This gives the department heads an idea of the work which is coming through. These orders contain full particulars as to the article itself, quantities, finish, etc. Cutting-bills, covering regular lines, are always on file. These are in the form of original tracings, Fig. 2. As soon as a "wood order" is received at the factory, a blueprint is made from the corresponding cutting-bill. The small figures shown above the finished sizes on the cutting-bill indicates the rough size or cutting allowance.

Picking Out Stock Parts

Before the cutting-bill is issued to the breaking-out department it is checked for stock items. This tends to prevent duplication. The stock items are divided into two classes, raw material and finished or piece parts. The raw material consists of parts which have been purchased outside, such as veneered tops and plywood or various kinds. Piece parts include various items which are run in quantities in the factory and carried in the stock room and may often include veneered tops and plywood panels when these latter pieces have been made in the factory. This distinction is made because in one case the part is shown as a purchased item while in the other instance the factory receives credit for its manufacture.

At the same time the cutting-bill is checked, a requisition is sent to the stock room for the trimmings required on that particular order. These are delivered to the trimming department, each order being kept in a separate box, where they are checked and receipted for. In this way there is no delay when the order reaches the trimming department.

The factory supplementary order, shown as Fig. 3, is used for what might be called interdepartmental orders. For instance, a certain desk might call for steel drawer slides or other steel parts which would have to be made in the steel-working plant. Such parts would be ordered on this form.

How Lumber is Calculated

After all stock items have been checked off the cutting-bill, it is sent to the breaking-out department. Those in charge of the swing cut-off saws secure the necessary stock from the dry storage. If for any reason it is found necessary to substitute material not called for on the bill, such as 5/4 stock instead of 4/4, such information is noted on the cutting-bill. After the order has been roughed out, the cutting-bill is returned to the superintendent's office where the net requirements of the order are calculated and tabulated on the back, and at the same time a requisition is made out covering the lumber used and forwarded to the cost department. This data is used by both the cost and record-keeping departments.

The total net requirements of the orders going through for any one month as compared with the total amount of lumber used, ascertained by monthly inventories of the stock in dry storage together with the quantity of lumber delivered to the dry storage during the same period, give the waste percentage for that month. After the net lumber requirements have been tabulated on the back of the cutting-bill, it is returned to the factory and the work put through, the bill remaining with the material until it has been completed. Rods showing full-size details are used for all stock work, and for certain parts where extreme accuracy is required, special forms and gauges have been provided.

Note how passage-ways are indicated in plant of Office Specialty Co.

Bonus Paid for Certain Operations

The various operations have been listed and designated with a number, and the workmen are required to use a separate time card, Fig. 4, for each individual operation. These are filled out, giving the required information and the time stamped on a job-recording clock. In this connection a bonus or incentive plan has been adopted for certain forms of

Forms Used in Plant of Office Specialty Mfg., Co., Limited Newmarket, Ont.

NO. OF SHEETS 1
NO. OF THIS SHEET 1

ELM
#700 FLAT TOP DESKS
Fig. 2

ORDER NO.
CLASS "A"
FINISH

EXPLANATION OF GRADE BY LETTERS

A. Extra select figure one side. B. Good figure one side. C Medium figure one side. D. Plain figure one side. E Clean stock two sides
F. Clean stock one side G Sound stock, not necessarily clear. H. One good edge. I. Two good edges. K. Must dress clean, full thickness.
When two or more letters are combined, stock must grade accordingly For Example. B. H. K. means—Stock must be good figure one side, have one good edge and dress clean the thickness marked on bill

Item No	NAME OF PARTS	SIDES SAND	No. Pcs.	LENGTH	WIDTH	THICK	MATERIAL	GRADE	INSTRUCTIONS	PIECE PART No.
1	Top	•	1	4'-0	2'-3/16	13/16	Elm Rough Dressed	F.I.		
2	" Cleats	:	2	2'-5	3/4	4 1/2	1			
3	Legs	:	8	2'-5 5/16	1 1/16	1 1/16	Elm	F.I.	Solid-1 Piece-No Taper	
4	End & Knee Sp. Panels	•	4	2'-1 1/8	1 13/16	7/4 3/4	"	"	F. 1/2" Tenons	

FORM 318

MAX. MIN.
Delivered in 3 months
In Stock
Holding Orders

WOOD ORDER
Fig. 1.

FACTORY ORDER NO.
CLASS

Material
Finish
Trim
Customer's Name Address
Date of Order Date Closed Output No.

DEPT. EMPLOYEES' TIME CARD ORDER No.
FORM 318
EMPLOYEE'S NUMBER REMARKS
SIGNED
Fig. 4.
MONTH YEAR

OPERATION NUMBERS

MANUFACTURING						EXPENSE				
1	11	21	31	41	51	101	111	121	131	S
2	12	22	32	42	52	102	112	122	132	
3	13	23	33	43	53	103	113	123	133	
4	14	24	34	44	54	104	114	124	134	
5	15	25	35	45	55	105	115	125	135	B
6	16	26	36	46	56	106	116	126	136	
7	17	27	37	47	57	107	117	127	137	
8	18	28	38	48	58	108	118	128	138	
9	19	29	39	49	59	109	119	129	139	
10	20	30	40	50	60	110	120	130	140	

OPERATION COMPLETED CLASS
ELAPSED TIME S B
EXTENSION

Fig. 9. REQUISITION FOR CRATING FORM 382

Date Shipping Order
Dept. Deliver to Dept. Class
Pieces as Below, or If Necessary Substitute as for Crates of Dimensions Given Below.

ITEM	No	LENGTH	WIDTH	THICKNESS	DIMENSIONS OF CRATES LENGTH	WIDTH	HEIGHT

TO THE OFFICE Fig. 6.
The following work was delivered to-day DATE TO DEPT.
Signed

ORDER No	AMOUNT OF PIECES	ARTICLE

FORM 304 SIGNED

Fig. 8. CLASS "C" ORDER NO.
TO DEPT. ORIGINAL SUB.
GIVE FULL DESCRIPTION OF REPAIRS OR ALTERATIONS NECESSARY

DATE Fig. 5. ORDER No.
Received from Dept.
For above order
Signed Foreman Dept.

COST
LABOR
MATERIAL
TOTAL

CHARGE DEPT IF DEFECTIVE WORKMANSHIP EMPLOYEE RESPONSIBLE
DEFECTIVE MATERIAL NUMBER OF MACHINE OR TOOL
DATE ISSUED SIGNED DEPT
DATE CLOSED

Date Fig 3. FACTORY SUPPLEMENT ORDER Order No.
Dept. Please make and deliver to Dept. Class
THIS ORDER FOR LABOR ONLY MAKE REQUISITION FOR MATERIAL

Date Delivered

Dept. Please perform the following work and deliver order with goods to Dept.
Date Delivered

ORIGINAL Signed
FORM 330—135535 91221

Fig. 7. ORIGINAL CHECK SLIP FORM 316

Date 19 Shipping No. Order No.
Del'd by Dept To Dept. The Following Goods
STOCK in Part Complete SPECIAL in Part Complete
Please Give a Good and Clear Description of All Articles.

COST
Labor
Material
Total
Credited
Balance

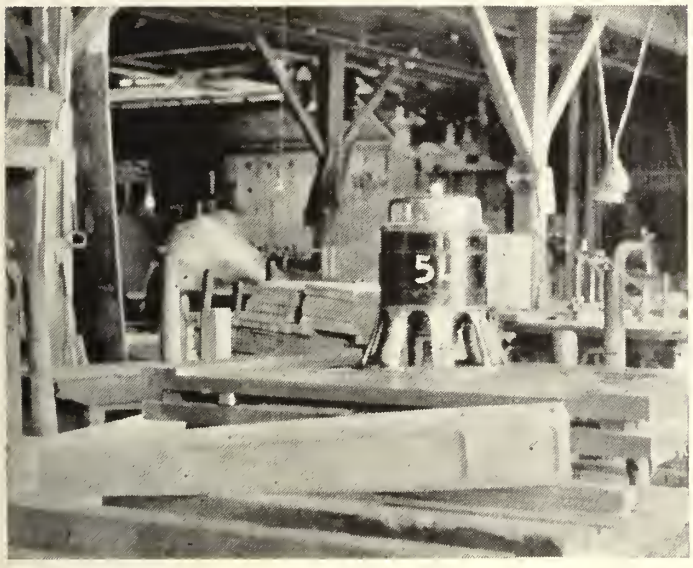
Signature Rec'd By

These forms are used to eliminate confusion and delays and maintain steady flow of work through the plant.

work. Standard costs have been fixed for certain operations based on time studies or the results of past performance. If a workman, through increased diligence or efficiency, succeeds in reducing the cost of that particular operation, he receives 50 per cent. of the savings thus effected. On operations of this kind a special extra pay card is used. If the cost is greater than the standard cost the workman does not lose.

As one department completes the work on a certain order, the material is passed along to the next department and a special receipt, Fig. 5, is secured, signed by the department foreman. This information is entered on the card headed "To the Office," Fig. 6, along with other deliveries made that very day, and the card forwarded to the main office every morning. This provides a close check on each order going through the plant as it shows where all the work is at any given time. In addition it provides a production report as it indicates the work completed in each department each day.

When an order or part of an order has been completed and delivered to the stock-room or shipping



Kelly routing machine in Office Specialty plant with sample of work in foreground

department, as the case may be, the "Original Check Slip" Fig. 7, is filled out and receipted. This indicates that the order in whole or part has been completed.

Check on Repairs and Replacements

Spoiled work is taken care of by a "Class C" order for, Fig. 8. This is used to order the repair or replacement of any spoiled article or part. In the case of a finished or nearly-finished article that has been damaged beyond repair, this form is used to write off the value of the article which has been rendered worthless. It will be noticed that the information given fixes the responsibility, both as to employee and machine, and also gives the total cost of the repairs or replacement, or in the case of a complete article, of the article itself.

Another special form, known as "Original Credit Requisition," is used for returning stock to stores. Suppose trimming hardware for 50 desks for a certain order had been delivered to the trimming department and for some reason or other only 45 desks were finally completed, this would leave hardware for 5 desks in the trimming department. The "Original Credit Requisition" is used to return this material to stores and to ensure that it is checked off and credited to the proper department.

Special Requisition for Crating

All crating is drawn under a special requisition, Fig. 9. This gives particulars as to the number and specifications of the different pieces required. As a rule the name of the customer for whom the order is intended is shown. With this data it is easy to determine the actual cost of the crating for each order, and as the crating stock is sized in what might be termed a "crating department," it facilitates the work of the packers, for the dimensioned crating stock is brought to them ready for assembling.

Where a delivery date is requested by the customer, a service card, not shown, is used. The service man visits the foreman of each department through which that particular order will pass, and ascertains how long it will take to put this particular piece of work through. In this way an accurate delivery date is secured and given to the customer. As the information secured from each foreman is recorded on the service card, it is incumbent upon him to live up to his promise.

Particulars of Plant Equipment

A few remarks with regard to the woodworking plant of the Office Specialty Mfg. Co. should prove of interest. The equipment consists of the usual run of woodworking machines, including double-end tenoner, straight edging saws, shapers, jointers, planers, dovetail machines, etc. Wherever practicable, special equipment has been provided for reducing manufacturing costs. Thus a special machine cuts 11 grooves and trims both ends of the drawer sides where a number of divisions are required; a six-spindle multiple boring machine handles all multiple boring, while another special machine trims and dados the sides for the vertical filing cabinets. An unusual piece of equipment for a plant of this kind is found in a "Kelly" routing machine. This is used for cutting sunken panels in legs of office and directors' tables and is also employed in connection with the making of the hollows in till drawers.

All equipment is driven by electricity, the group drive being employed. An unusual, but worth-while feature of this installation, is that all motors and mainshafts are placed under the floor. This not only does away with overhead belts, but makes it easy to oil and attend to the transmission equipment. Another advantage is that the motors and bearings are not subjected to the deteriorating effects of factory dust. The current, which is 60 cycle, is generated from steam power, utilizing shavings and other factory waste.

Another interesting feature is that the passageways on the machine floor are all marked with heavy painted lines. Instructions have been issued that these alleys are to be kept clear and unobstructed at all times. This aids in the movement of material as there is nothing to interfere with the free movement of the factory trucks.

Barrels Hoops from B. C. Woods

Manufacturers of cooperage stock in Canada will, doubtless, be interested in the new Pacific Hoop Co., which was recently organized in Portland, Oregon, to manufacture coiled hoops from spruce fir and other Pacific Coast woods. This new venture has been made possible by a patented process through which the hoops pass preparatory to coiling.

Only Well Managed Plants Survive

Third and Last of Series of Articles Dealing With the Organization and Management of Woodworking Plants

By L. G. Cattermole*

In conjunction with the other phases of betterment methods, plans should be laid for the development of an organization with clearly defined duties and responsibilities. Contrast two actual organizations as they exist today in the woodworking industry. Both plants are about the same size, both employ about the same number of men, and manufacture a similar article. The two sons of the original founder of the business in both cases are taking an active interest in the direction of the business.

In the first organization the duties of each member are clearly defined—the elder brother is in general charge of the business, the younger brother has direct charge of all manufacturing. The younger brother is expected to attain results—and he does it, because he has full authority to enforce his orders. In the second organization the duties of no executive member is defined in any manner whatsoever. The elder brother is supposed to take general charge of the business, but owing to his vacillating policies and lack of ability to make decisions, other members of the organizations constantly exceed their authority and make his decisions for him. The younger brother is also supposed to have direct charge of manufacturing, but the general manager is constantly going over his head, and giving detailed instructions to his subordinates without consulting him. The result, as can be easily imagined is chaos.

A Pointed Question

If a plant reflects the personality of the guiding executive are you satisfied with what your plant indicates?

In the first plant, a smooth-running organization performs its duties in a quiet, capable manner, friction is practically unknown, and a condition of contentment pervades every member. In the second plant, friction, trouble, and discontent is everywhere apparent; no one troubles about performing their duties in the most effective manner, and a large labor turnover is experienced. It is true, as someone has stated before, that every organization is a reflection of some one person as its executive head. Whether the organization is a failure or a success is dependent upon the policies which are inaugurated by this person. But he must be big enough, broad enough to realize that he cannot, except in the very smallest of manufacturing establishments, hope to handle all the details of the business personally.

It is necessary, to prevent stagnation, for an organization to secure "new blood" from time to time. An ingrowing organization may never hope to attain the success that an organization which is constantly adopting new men, new methods, and new machinery. A large plant in New England had a plant executive who had been with them for twenty years. Every one in that organization, from the president down, knew that this man was no executive, in fact he had become so lazy he seldom gave an order or made a decision. The plant he was in charge of, reflected this spirit, in that it was only producing about fifty percent of its possible capacity. He was being kept "because he knew machine operation," as those above him expressed it. When it was shown that he was many years behind woodworking progress on the points with which he was supposed to be most familiar, he was given an opportunity to make good in a smaller job, in one of the company's smaller plants, and his old position was given to an outside man with no experience in that particular industry. The change was found to be a beneficial one for all concerned, the change awakened the man from his comatose condition, and he was later taken back into a position far superior to his original one. The new man, through his aggressive, indominatable spirit, awakened the workers to their responsibilities and within a short time had the plant attaining ninety-five percent of its possible maximum capacity, with a standard of much higher quality.

Where is Your Organization Weak?

The general manager of a woodworking plant employing over three hundred men, had delegated no one to assume authority during his absence. For four hours each afternoon he worked, personally, behind locked doors, on a speed boat for his summer camp, and gave orders that during that time, he was not to be disturbed. Yet he has been heard to reflect aloud that his plant is going to the demnition bow-wows, and he couldn't understand why.

The above are exaggerated cases, undoubtedly. At the same time they reflect the idiosyncrasies which are costing many concerns real money. Straighten out a great many of these organization defects, and greater sales, greater profits, greater happiness and smoother-running organizations will be the result.

One of the last things to be undertaken by industrial engineers during the period of installation of management methods, are the final definition (in consultation with the clients' executive personnel) of the manufacturing, sales and financial policies.

Briefly, these policies include simple methods, whereby conditions in any or all of these phases of the business can be quickly and effectively analyzed and adjusted to meet current conditions. One of the real tests of any concern is its ability to readily adjust itself to current business conditions, which be-

*Chief Industrial Engineer, Cooley & Marvin Co.

comes a simple problem if general policies have been outlined to meet such conditions; and methods of analysis have been developed to point out the "rocks on the sea of progress."

Necessity of Planning Ahead

Most woodworking concerns have developed over a period of a long term of years, without any definite plans having been laid for growth or expansion. As a result the buildings are poorly adapted to the manufacture of the product, and are poorly arranged as regards their relative position to each other. It is desirable that a study of the possible future development of the concern should be made, and plans for expansion so outlined, that future contingencies will be taken care of, as soon as the necessity for change arises.

The above general discription of methodizing a woodworking plant is intended as a help to all managers who plan to improve their conditions, regardless of whether done by their own organizations or a firm of outside specialists. A disinterested current article in one of the leading trade papers has this to say regarding the necessity for this work:

"The days of real, stiff competition are on us once more and only the well managed plants—will survive.

"The three greatest factors toward success are machine equipment, methods, and men, and it's a toss-up as to which comes first.—Now is the time—to lay plans and get ready for the battle of trade. Study your machine equipment—. Study your methods. Eliminate the waste and lost motion that grew up when the only object was big production. Hire a real engineer to do it for you if necessary. But get one who is not full of fancy frills. Plain horse sense is the best qualification he can have—.

"And don't forget the men—the human problem is, after all, the biggest—and getting larger every day.

"These three factors are the legs of the stool on which success must sit."

And entirely outside of the necessity for bettering conditions there is a reward—a material reward which can be measured in terms of dollars; a mental reward which will key up the entire organization to thinking about its work, rather than performing its duties perfunctorily; a spiritual reward which comes from the knowledge of having discharged part of the responsibilities of management by bettering the conditions of those dependent upon the business for a livelihood.

The Facts Behind the Cost Figures

How Cost Data Should be Used—Indicates What Lines Should be Pushed Hardest—Influence of Production on Cost Often Overlooked—Sometimes Advisable to Accept Business Below Cost Shown by Records

By J. Lee Nicholason*

In studying the process of manufacturing through figures, it is not sufficient that the executive give consideration only to the cost of articles. These figures are reflections of conditions into which enter other elements very essential to utimate welfare. Without a proper knowledge of such elements and their variations, the possibilities of a situation are not brought out and policies of operation for the future may not be founded on facts.

A cost system is necessarily supported by statistics which show their value and relation to the moving situation. They are necessary as a presentation of running facts illuminating conditions for the information of the executive so that his judgment and energy may be guided by certain knowledge. The facts must be shown to make the situation clear, otherwise he may be misguided. Cost data may be divided under two principal heads, namely, administrative reports and reports for the sales department.

The purpose of administrative reports may be suggested as follows:—(a) To determine what changes may be made in the cost system to secure better data; (b) For the purpose of taking executive action on leaks, as indicated by the cost reports, such, for instance, as unbalanced operating departments, defective work, and excess overhead; (c) For the purpose of determining executive action in connection with the sales department.

Many Leaks Often Shown

Reports for the administrative department should be analyzed in as brief a form as possible and may be either daily, weekly or monthly, depending upon the conditions existing in the particular plant. They should be drawn as far as possible in comparative form and should show the daily production of each department, material, labor and overhead costs, and the percentage of overhead to production.

While looking over the cost system a number of years ago in a large manufacturing plant, employing over 2,000 people, I discovered very good reports to the executive. These, I observed, indicated many leaks and exhibited conditions which should have been corrected, and which, if corrected, would have lowered the cost of the production considerably. I remarked to the head of the cost department, "Evidently you are getting a great deal of good from your cost system.'

"On the contrary," he said, "we are getting very little good from it. I am instructed to file the reports with the general manager, but I very rarely hear anything more about them."

The general manager, who was practically the head of the business, had requested me to review his organization as a whole, so I took up the question of the cost reports with him.

Reluctantly he admitted that his duties did not permit him to give these reports the attention they deserved and required. He had the burden of the sales department on his mind and was frequently away. However, he always had intended to look over these reports and take action along the lines indicated.

"But," he said, opening a drawer in his desk and exhibiting a heap of them, "they accumulated too rapidly."

"Do you consider that a good business policy?" I asked.

"No," he admitted, " it is not."

"What would you do with one of your department

*In "Trained Men."

heads, if you knew he neglected the duties entrusted to him as you have neglected to study these cost report?"

"Let him go immediately!" he asserted, with great positiveness. "But what am I to do?" he went on in distress.

"One of two things," I answered. "Either find time every day to examine the reports and act upon them accordingly, or delegate this responsibility to some one else."

Cost System Best Investment

Considering the expense and effort attached to the operation of a cost system there are a surprising number of cases in which the cost data is not utilized. Of course cost systems are too expensive to operate, as some charge them to be, when the cost data is not properly utilized. However, no matter what the operating cost may be, a system is not too expensive, if the data supplied is used in a practical manner. In fact, I do not believe that a better investment can be made by a manufacturer. Failure to utilize does not rest with the head of the cost accounting department but with the executive. Imagination, practical instinct, and the co-operation of the executive organization are vital necessities in the attainment of results of maximum value.

Cost reports should be devised in such a manner that the figures represent something more than mere figures. Where a leak or a wrong condition is existing, figures alone might not be sufficient to enlighten an executive. In that case a note should be attached, calling particular attention to whatever phase that requires action.

There has been much criticism of cost systems in the last fifteen years; in fact, ever since the cost system was known. Its introduction has been almost forced on the manufacturer, all because the benefits are rarely understood or used. If the average manufacturer had as clear a vision of the value of a cost system as he has of selling his product, for instance, no further argument would be necessary. To perfect his business to the finest possible point, he would seek the best methods of cost accounting with just as much energy and enthusiasm as he seeks the market for the disposal of his product.

Indicate Articles on which Profit is Largest

Cost reports used in connection with a sales department are, I believe, of more value in promoting profit than any other element in connection with cost accounting. Unfortunately sales departments are often kept in absolute ignorance of the cost of production. As a rule a manufacturing plant has a number of different articles which it manufactures and sells. Of course the cost of these articles and their selling price varies. In some cases certain articles are sold at cost and even below, a condition brought about by competition and trade conditions. Sometimes one article must be carried to help sell some other product. A salesman is not required to sell an article upon which there is no profit, we are told, because the article practically sells itself. On the other hand, the salesman has before him at all times the temptation to sell the article which is easiest to sell.

A number of years ago, when examining the organization of a wholesale grocery business, I discovered that it was paying its salesmen a fair salary, plus a small per cent. of commission and traveling expenses. By examining the detail records of the men, I also discovered that the sales by some of them, of sugar and a few other things, upon which there was no profit, amounted to more than 25 per cent. of their total sales, whereas the per cent. of other salesmen on the same articles was as low as ten per cent. It was not difficult to see who were the money makers for that concern. The incentive to sell an article upon which there was no profit was removed, but there was created an incentive to sell the more profitable articles.

The sales and the manufacturing departments are of equal importance. Goods cannot be sold, of course, until they are made. One of the fundamentals in manufacturing is to determine the volume of sales to be made before a profit can be realized. The cost of material and labor in manufacturing is fairly constant with the production, but the overhead does not advance or reduce in the same proportion. It can be very clearly seen, therefore, that the sales and the manufacturing departments should work very closely together, always remembering that the cost of manufacturing, on account of the overhead, will either represent profit or loss, depending entirely upon the volume of manufacture.

Overhead Influenced by Production

A large sum of money is lost each year because the selling price is based upon a large production and then sales are made in small quantities which, of course, increase the cost per unit. In such a case, often the cost of the article is higher than the selling price. I have known numerous cases where costs were based on units of dozens, or hundreds, or thousands, and where sales were made in quantities of one-twelfth, or one-sixth, of a dozen, or in lots of five, ten, or one hundred, when sales should have been by the thousand. If the cost data is brought to the attention of the executive and if the sales department shows actual loss in these cases, such a picture should be presented that the facts could not easily be disregarded.

In fixing the selling price, one of the most important elements to consider is overhead. Especially is this true if the system shows departmental overhead, which has a tendency to put overhead directly where it belongs. As I have said before, the relation of this cost to quantity should always be recognized, for it must be remembered that if the sales and production of a single article falls off, not only is a heavier overhead added to the smaller production, but the overhead on the other articles is also prorated and increased, thereby reducing the profit as a whole.

When called upon to make a price which would increase production, a manufacturer is very apt to figure upon the same margin of cost or overhead as shown by his records up to that point. If he should happen to have competition, he is liable not only to lose the order and the profit on the order, but he will also probably reduce the profit on other items manufactured.

How Business is Often Lost

The president of a large manufacturing plant in Connecticut appeared unusually depressed when I was in his office. When asked why, he told me that he had just lost a very large order of approximately $250,000., which had gone to a competitor. But he was feeling especially bad because, when given an opportunity to revise his figures, he could not see his way clear to change them, according to his cost re-

cords. It was a repeat order, but the buyer had received a bid from another concern for the same article and same quantity at a lower price. This article was manufactured complete in one particular department of the plant.

The loss of the order would increase the overhead on other articles manufactured in that department between thirty and fifty per cent., and also would increase the general administrative overhead about ten per cent.

I asked to see the figures and found that in figuring the costs, he used the same percentage of overhead as was used before, and then added to it the usual percentage for overhead, administrative and selling, to figure out the profit and selling price. No selling expense was attached to this order, for no salesmen were employed in securing it. Furthermore, the administrative expense would remain exactly the same, whether he took the order or not. Taking all facts into consideration, we revised our estimate and discovered that, in cutting out the administrative overhead and the selling overhead, and by revising the departmental overhead, he would have made $50,000.00 on this order, covering a period of only three months.

Many stories of this kind could be told, but the idea I wish most to impress upon the mind of the manufacturer is the great importance of the proper use of cost data. Without it your effort will be in vain, and you will grope in the darkness. With it, you have at your command a force for success.

What is Your Cost on this Set of Stairs?

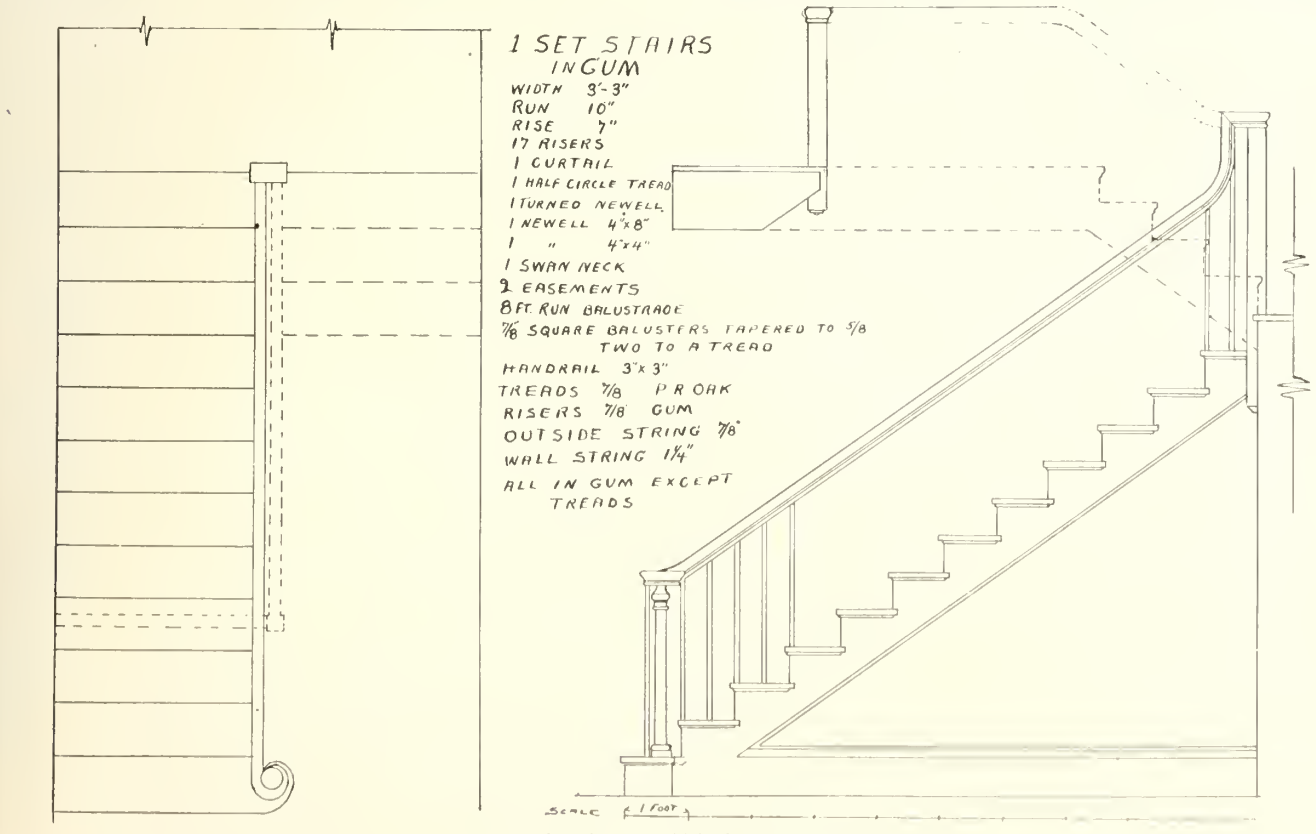
Application of Cost Book "A" by Millwork Cost Bureau—Far too Great a Variation in Time and Material—Why Greater Attention to Costs is Necessary

What do you think of a variation of $10,000.00 on a $30,000.00 job. Figures were requested recently on the interior woodwork for a large hall. This work was extremely elaborate and intricate and required a large amount of hand carving. Among the estimates submitted was one prepared by a woodworker who carefully listed and estimated every detail of the work, basing his figures on records of past performances. Before sending in his estimate, he rechecked his figures and satisfied himself that his bid of $33,000.00 was a fair one based on the quantity of material and amount of work involved. You can understand his feelings and thoughts when he learned that a competitor was awarded the work on a basis of $23,000.00, or $10,000.00 less. What is more to the point, how will the successful bidder come out. This points out the necessity for arousing a greater interest in accurate costs.

With such an interesting study as stairs for a subject for the cost article in this issue, instead of only sixteen sets of cost figures, it should have been possible to show twenty-five or thirty. Unless those who keep costs and realize the value of arousing a greater interest in accurate costs, are willing to do their part to maintain interest in this series of cost articles, it is going to be difficult to accomplish the desired results.

Competition the Unknown Factor

It does not require a very great stretch of one's imagination to hear some of the "guessers" say "Why



Sketch of stairs on which figures were taken

Estimate by Millwork Cost Bureau

1 Flight stairs, sap gum, per detail fitted and K. D. No rough carriages, platform flooring nor base.

Application of Cost Book "A"

Box stair	Basis Pg. 852 D. Plain open one side			
$2.40	Strings	$2.54		
.12	Thicker string (853 D)	.12		
3.24	Pl. R. O. tread	5.16		
.60	Riser	.70		
6.36	Total per riser	8.52		
3 Risers (No. 1-13-17) Box (852 D & 853 D) @			$ 6.36	$ 19.08
14 Risers open one side (852 D & 853 D) @			8.52	119.28
1 Half circle start step "H" Pg. 855 D @			12.00	12.00
1 Newel "N" (Pg. 862 D) @			12.50	12.50
1 Twin newel N. 4 in. x 8in. (Pg. 862 D) @			12.50+10%	13.75
2 Newels housed (Pg. 862 D) @			3.80	7.60
1 Newel turned—estimated				9.80
24 Lin. ft. rail "C" (Pg. 871 D) @			.88	21.12
1 Gooseneck (Pg. 872 a) @			23.00	23.00
1 Flat spiral (Pg. 872 a) @			75.00	75.00
2 Straight Easements (Pg. 872 a) @			12.00	24.00
47 Bals. s 4s tapered (Pg. 881 c) @			.52	24.44
8 Lin. ft. wellhole skirting (855 D) @			1.20	9.60
	Total C. B. A. List			$371.17
"Basis cost" Pg. 3—less 60%				$148.47

all this fuss about costs when out of the whole of Canada only fifteen woodworkers are interested in cost work?" There is this to be said in favor of participation in these studies, and that is, no matter how much you know about your own costs and regardless of the degree of accuracy with which you are able to estimate, such knowledge does not count for much when figuring against those who guess. For this reason alone, if for no other, it is your own best interests to take an active part in any movement which tends to raise the standard of the competition with which you are faced.

An interesting feature of this article is an estimate from the Millwork Cost Bureau based on their Cost Book "A". In submitting these figures, they have this to say:

"Kindly note that this flight of stairs is figured completely machined and fitted, so that the contractor will have no trouble in setting up the work; but the material is delivered K.D. As rough carriages or horses, and platform flooring are sometimes furnished as a part of a stair, it is important to note that our cost does not include these items.

"In the application of Cost Book "A", illustrated in our cost estimate, you will note that each part of the complete stair is figured as a separate unit, and the pages of Cost Book "A" from which the prices were taken are marked in connection with each separate item. The total Cost Book "A" list is shown, as is also the basis cost, which is arrived at by deducting 60% from the Cost Book "A" list.

"Your list of material simply calls for Gum and we understand that in this instance you desire Sap Gum and not Red Gum. We note from your list of material that terms are in use in your territory which in some instances are at variance with those more widely used; for instance, in most territories a swan neck would be termed "gooseneck". We do not know what part of the stair you would term the curtail, but we have simply figured the entire piece of work using our terms throughout, which we trust will be perfectly clear.

"You will possibly observe that, while in a general sense, this stair is considered open, we figure three of the risers to be box risers in nature, and have figured them accordingly. Such risers in stair flights as do not require face strings are considered on the box basis. All other risers in the flight are considered either open or curb, as the case may be. In this instance, risers 1, 13, and 17 do not require face strings and, therefore, are figured as box stair risers.

"The drawing does not indicate the number of balusters that are required for the spiral rail at the start; in fact, only one baluster is indicated on the

Detail of Cost

Material			
180′ B. M. Red Gum @	$175.	$31.50	
64′ B. M. Core Pine @	50.	3.20	
80′ B. M. Pl. Red Oak @	175.	14.00	
40′ B. M. ⅛″ Gum Veneer @	50.	2.00	
36′ B. M. ⅛″ Cull Veneer @	20.	.72	
		$51.42	
Waste 25%		12.85	$ 64.27
Labor			
Machine 42 hrs. @	$1.20	$50.40	
Bench 69½ hrs. @	.90	62.55	$112.95
			177.22
Commercial Burden 20%			35.44
Total Cost			212.66

elevation, but we concluded that at least three would be required for the starting spiral and have included this number in our estimate. We would judge from the drawing that the mill would be required to furnish wellhole skirting or trim around the wellhole, and we have therefore figured eight lineal feet of plain wellhole skirting."

Average Costs Good Guide

While the figures kept on the job, No. 10, show a cost of $212.66, it is doubtful it the estimate of the Bureau showing a basic cost of $148.47, is as far out as it at first appears. The manager of the plant which did the work admitted that his cost is high. It is accurate enough, but he believes that more time was put on these stairs than was absolutely necessary; in

tact he thinks that a fair average figure for this piece of work would be in the neighborhood of $165.00 to $175.00. This bears out the contention of the Millwork Bureau that the cost on any one order is not a suitable basis upon which to estimate. Costs fluctuate beyond the control of this management. That being the case, the only accurate basis to use for estimating, is average costs. This is the Millwork Bureau idea with regard to Cost Book "A", only the average costs used are the average composite figures taken from the 500 plants comprising the membership.

A reference to the list of estimates submitted shows the usual variations. There is no doubt as to which one would receive the contract, and there is just as little doubt as to whether or not a profit would be made. The material column shows too great a fluctuation. While there is always bound to be some difference between the material charges at different plants, there is nothing to justify a variation of 100%, just as there is nothing to justify the difference of 150% in total costs.

Small Waste Allowance

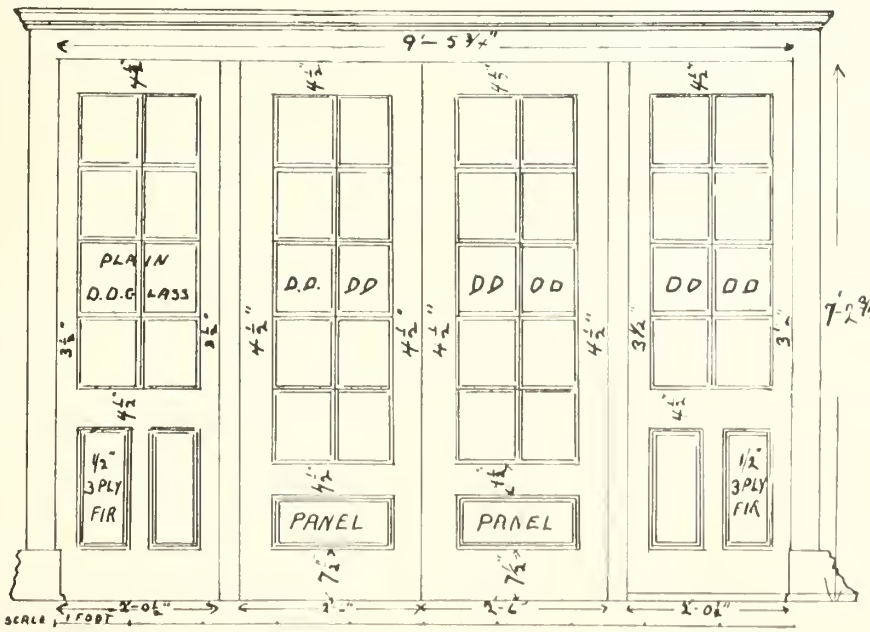
The first item in the waste column will probably give cause for amusement. A 10% waste allowance on a job of this kind is totally inadequate. The same holds true of those who only allow 15%. They lose out here, for the waste is bound to be greater than this. I had access to some cost records not long ago and the total average taken for a period of 12 months was slightly in excess of 45%. This was in furniture work and may not be a good comparison but it indicates how the waste mounts up.

The other columns may well speak for themselves. The estimates of bench hours vary from 116 to 25½ hours, and the rates from 85 cents to $1.10 per hour; machine time from 13 to 72½ hours and the rates from 85 cents to $1.50 per hour. This should not be so. There is no reason why the bench work should take four times as long in one plant as in another or the machine work show a variation of nearly 500%. There is something radically wrong with the basis upon which some of these estimates were made, that is, if there was any basis which is extremely doubtful in some instances.

A set of French doors, as shown in the accompanying sketch, has been selected for the June cost study. This is a job that every woodworker is often called upon to make. Particulars are 1 3/8", B. C. fir doors, with D.D. glass. The lower panels are ½", 3-ply fir. This order called for doors only, and in the white. Don't let the other fellow do all the estimating. That is not the proper spirit. Take the first chance you get during the next day or two and figure out your idea of the cost of these doors. You will be interested in learning how your estimate compares with the others submitted. A better suggestion is to send your estimate in by to-day's mail.

List of Estimates Received

No.	Material	Waste	Bench hours.	Rate	Machine hours.	Rate	Commercial Burden	Total
1	$36.80	10 %	43	$ .80	13	$ .90	15	$ 98.60
2	43.72	15	52	.85	17	.85	20	106.30
3	52.70	25	40	1.00	16	1.50	15	117.01
4	69.40	20	49	.90	27	1.30	20	141.35
5	58.67	15	63	.85	23	1.20	15	165.45
6	69.40	15	50	1.00	20	1.25	20	173.28
7	53.95	25	57	.90	36	1.20	20	179.62
8	67.45	27½	25½	1.00	72½	1.25	15	197.65
9	48.80	15	45	1.00	53	1.15	20	203.27
10	**64.27**	**25**	**69½**	**.90**	**45**	**1.20**	**20**	**212.66**
11	47.86	22½	116	.85	32	1.07	20	216.84
12	68.66	20	72	1.00	39	1.30	15	229.80
13	67.55	22½	72	1.00	36	1.50	20	232.26
14	56.17	25	81	.95	48	1.20	20	237.65
15	64.73	25	110	1.00	46	1.25	20	243.73
16	71.86	30	120	1.10	51	1.40	25	267.15



Subject selected for cost study for the June issue. Don't let this one pass

Principles Involved in Drying Last Blocks

Kiln Drying These Small Irregular Shaped Blocks Presents Difficult Problem—Careful Operation Required—Short Air Travel Improves Drying Operation

By K. Redman* Dry Kiln Engineer

The drying of shoe lasts, bowling pins and similar sized hardwood products presents many unusual problems undreamed of by the ordinary kiln operator who handles only 4/4 stock. In the first place the size of the rough turned last is several inches in thickness thus forming a large core. To dry this core without drying the outer portions of the last at a faster rate is one of the features to be accomplished. Again, the end evaporation must be kept down for there is no great allowance for end checks and we all know the tendency of the ends to dry faster than any other section. The odd shapes and various sizes met with in a single kiln charge adds to the difficulties for there is no possibility of regular stacking, uniform flues etc., for the passage of the air, as is the case in the regular tiers of lumber, for they are thrown into the kiln in a hit or miss fashion.

Let us consider the block, which is in cross section like a shoe only considerably longer, as divided into two portions, the outer ½" called the shell and all the remaining inner section called the core. The cardinal principle to be observed in actual drying practice is; "to dry the shell at a rate not faster than that at which the moisture can flow or work out from the center of the core to the shell." Although this principle is true of all lumber drying it is of the very greatest importance in successfully drying last blocks.

Checking and Case Hardening Chief Troubles

The thickness of the shoe last with its large core is the cause of the difficulty in drying. When the drying progresses too rapidly the shell dries faster than the core, the actual shrinkage being in the same proportion. Thus the fast shrinking shell is drawn tightly about the slower shrinkage core until the stresses set up become so great that the fibres pull apart and the block is checked and ruined. Or, on the other hand, the shell may case harden and set in an extended and rigid shape. Then, when the core dries out more slowly and hence shrinks further in proportion, the case hardened shell resists this further shrinkage, and the outer parts of the core clinging to the shell cause the core to give way in the center. These are commonly called honey-comb or hollow-horn checks.

In order to dry successfully we must have kiln equipment delivering the proper quantities of heat and moisture to the blocks by means of a uniform flow of air. The air in this case acts as the drying agent delivering to the blocks heat and moisture; heat is given up in exchange for the moisture and the air continues on carrying away an additional amount of moisture to be discharged outside the kiln. But, why does the air carry moisture to the block in the first place? Simply so that there will not be too great a transfer of heat in exchange for moisture, thus causing too rapid drying and hence checking and even splitting. You consider the humidity of the entering air as a sort of safety device to protect the blocks from damage.

Another factor to consider is to make positive that these drying conditions are delivered to each and every block, alike, throughout the entire kiln. Of course, it is impracticable to have a kiln chamber for each last block which theoretically would be ideal, but it is possible to cut the travel of the air across only a few feet of piled blocks, rather than through eight or ten feet. Under the latter conditions the air picks up the moisture from the first blocks encountered and by the time it has travelled through five or six feet it may be depositing moisture rather than picking it up.

This leads to the principle that the kiln must not be overloaded in a similar manner than one might overload an electric motor. Overloading in this case is too great an air travel through the blocks with consequent uneven drying conditions in the kiln. To sum up, there must be positive and continuous control of heat, humidity and circulation with the air only travelling across a few blocks so that the drying will be uniform throughout the entire kiln and identical conditions delivered to each and every block.

Automatic Control Desirable

To accomplish the above requirements the writer believes the best results can be obtained by heating and humidifying the air before it enters the kiln and distributing it by a system of ducts so that each block receives an equal amount of this properly conditioned air. Kilns have been designed in which the air only travels across 3½ ft. of blocks and in this case the last foot of blocks receives practically the same treatment as the first. Of course, the kiln buildings in any case must be constructed so that extreme cold weather won't materially affect drying conditions.

The drying equipment should not only consist of heating and humidifying apparatus, but these should be controlled automatically and the conditions recorded day and night by a psychrometer. Testing instruments must be on hand so that the operator may know the exact amount of moisture in both shell and core and the difference should not be permitted to exceed 5% at any time. When a greater difference is found the blocks should be steamed so that the M. C. of the shell will equal or closely approach that of the core.

General Practice Past, Present and Future

In the past it has been customery to air season in large sheds for six months to a year before it was considered safe to put the blocks in kilns. This was before the day of humidified air, when dry air was used to accomplish final drying only. Today it is possible to put green blocks fresh from the lathe into the kiln, but most kilns force the air through six to ten feet of blocks and thus slow up the drying time of the entire kiln to a period of forty to fifty-five days, depending upon the original moisture content.

Tomorrow will see the general use of the kiln with only a three or four foot air travel, with all the blocks drying practically as a unit and the time consequently cut nearly in half. Where drying conditions may be manufactured at will, there is no sense nor economy in trusting in the kindness of a fickle weatherman.

*B. F. Sturtevant, Ltd., Galt, Ont.

How to Look After Band Saw Teeth

Special Attention to Swaging and Shaping Teeth —Three Gauges More Than Thickness of Blade for Best Results—Attention to Saw When Grinding

If the saw chatters in the cut, runs snakey at times, and does not make the lumber as smooth as it should, the difficulty may be in carrying too much swage, particularly when sawing hardwood. Usually about three gauges more than the thickness of the saw is sufficient. Sometimes even a trifle less than

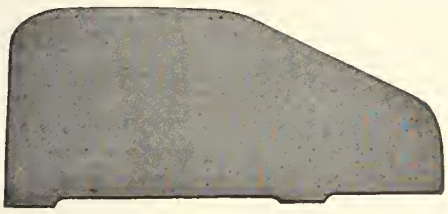


Fig. 100—Gauge for testing teeth

this will work satisfactorily provided the blade is perfectly flat and evenly tensioned. Make sure that the teeth are properly dressed after swaging, otherwise they soon become dull, or the slender corners drop off.

The eccentric swage, in forcing out the corners, causes a depression or dent just under the points of the teeth. To face the teeth properly the fronts of the teeth must be ground sufficiently to take out most of this depression and to thicken the points to the required stoutness with which to stand the shock of cutting through knots without dropping corners. Swage just enough—no more—to get a dressing on the corners. If too much, the points will buckle when shaped. By compressing more than is necessary the points are apt to be injured, causing them, in many instances, to drop off. Therefore it is best to swage lightly and it will not be necessary to shape heavily.

When the teeth are all thoroughly swaged and

Fig. 101—Showing how every alternate tooth is tested

shaped, examine with a set gauge (see Fig. 100) to see if any are bent. Test by holding the gauge on each side alternately as shown in Fig. 101. If any of the teeth are out of line, bend them with a set wrench as shown in Fig. 102, to the right or left as may be required, until all are even. Extreme care should be taken to have all the teeth in perfect line, for any of the teeth, if even slightly bent, will cut roughly, and in passing through the board will naturally incline out of the cut, frequently breaking off.

After the teeth are nicely swaged, shaped, and straightened, the saw is ready for the automatic sharpener. Unless care is used in operating this machine all the good work just done will be spoiled. Bear in mind that the points are delicate. Do not try to get the work done in one time around the saw, but cut lightly several times until the teeth are well faced. This does not mean to take out all the depression made by the swage, but most of it. Of course, enough cutting must be done on the gullets and on the backs to keep the teeth in shape, and ground to point, as the automatic sharpener will keep the teeth even when all are brought up to the cutting edge. If they are not ground to point there will be high and low teeth.

Remember that too slender a tooth will cause chattering in the cut, and will make "wash-board" lumber.

Look after the sharpener frequently. Do not allow lost motion. Remember that emery dust will get

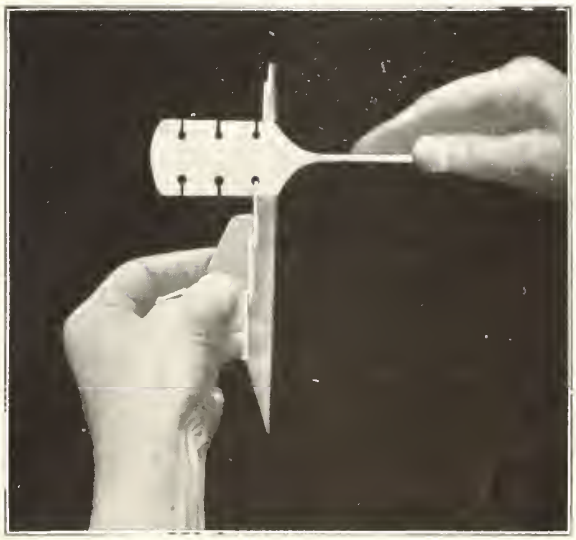


Fig. 102—Wrench for straightening bent teeth

into the running parts and cut. If this is not cleaned out the machine soon will be missing the teeth.

Grind the entire surface of the tooth and the gullet every time in order to present new steel to the work after each sharpening operation. Having each tooth in a band saw of the same width is quite as important as having them a uniform length.

Do not neglect your swage sharper. Examine it from time to time, after considerable use, to see if the dies are becoming worn by reason of the saw teeth frequently coming in contact with the same spot. If they are worn, then the swage on the teeth is not given sufficient back clearance to allow the side-dress to do its work without unnecessary friction. A saw with teeth improperly side-dressed will run "snakey." Keeping the dies in good condition and properly adjusted means a saving in labor and expense.

When a foreman cannot control his temper because things are not going as he wants them, it is time for him to consider whether he has not mistaken his vocation.

Bruce Wood Workers, Limited

Chesley, Ontario boasts a growing industry in the activities of the Bruce Wood Workers, Limited. This company was organized slightly over a year ago to manufacture wood products of various kinds and in particular to make extension table slides, bent rims for tables and table pins. Almost from the start these products have been in strong demand and they have been successful in developing a satisfactory volume of business.

The plant is housed in a bright, well-ventilated building, and includes such equipment as sticker, with special attachment for running the dovetailed

Table slides in process

groove in the table slides, jointer with power feed attachment, power feed rip saw, planers, automatic lathes, bending equipment and hardwood flooring machines. All material for the slides is thoroughly dried to preclude the possibility of warping and twisting and then trued up on the power feed jointer and run through the sticker. Every precaution is taken in both the initial manufacturing and assembling operotions to turn out a product that will give long service and lasting satisfaction. These slides are being marketed under the trade name, "Bruce Slide."

The rims produced are of the solid bent type. Stock is first run through the sticker, sized and one corner rounded. It is then taken to the bending department where it is steamed, bent and placed in special forms until dry.

The pins which are of the taper variety, are produced on an automatic turning lathe. From there they are put through a tumbler which smooths and polishes them. These are used in large quantities in the manufacture of extension tables, being used in the leaves.

A new departure, yet one that is proving successful, is the manufacture of hardwood flooring. Special equipment, which is in the hands of experienced men, was installed for this work. The usual run of widths and thicknesses in such woods as maple, birch, plain and quartered oak, is being manufactured.

In addition to these regular lines, special work of various kinds is continually going through. A considerable volume of business is being done with various automobile factories. Taking it all in all, this young organization appears to have a very prosperous future.

J. R. Shaw on Workmen's Compensation

J. R. Shaw, of the Canada Furniture Manufacturers, Limited, Woodstock, speaking before the Joint Safety Convention at a luncheon in Toronto recently, emphasized the advisability of having those protected by the Workmen's Compensation Act, contributing their share, of the funds required to carry out the provisions of the Act instead of the employers bearing the whole load. If this were done the worker would have a direct interest in the administration of the funds and would, on this account, be more inclined to make an effort to see that the money was properly distributed. This would have the effect of improving the application of the Act, for if the workers were more interested in the distribution of the money, they would take pains to see that their less scrupulous fellow-workmen did not malinger or in other ways make improper inroads on the funds. In certain European countries this policy is in force.

Mr. Shaw also quoted figures showing that 45% of all accidents occurred among agricultural workers. Recognizing this, insurance companies have classed farming as an extra hazardous risk. The rate for insuring a farm laborer is three times that for which a bank manager is insured even though the latter is exposed to all the hazards of city life, such as street cars, automobiles, elevators, etc. In view of this the farm worker should receive adequate protection and the farmers be brought under the working of the Act, the same as other employers of labor.

A strenuous protest was also registered by Mr. Shaw against those provisions in the Act which requires employers to include on the pay-roll for compensation purposes their office staffs and extra provisional staffs. These men are not exposed to the hazards of the industry and should not be included under the Act.

U.S. to Have "National Furniture Week"

At the annual meeting of the American Homes Bureau, held recently in Chicago, action was taken on the suggestion of having a "Better Homes Week" throughout the entire United States some time during October. The idea is to have a demonstration and special furniture displays in every city, town and village of the whole of the United States. Other features adopted at this meeting include a series of syndicated articles dealing with better furnished homes, including interviews, dealing with the home, from cabinet members, nationally-known educators and well-known clergymen; a series of moving pictures tending to teach the value of better furnished homes; text books for use in public schools, dealing with the science of home-making, interior decoration, color schemes, etc., and some work in connection with the "Federation of Women's Clubs."

It is anticipated that this "National Furniture Week" will be an outstanding event and will do much toward implanting the idea of better furnished homes in the minds of the American public.

Box Industry Must Reduce Costs

Extracts From Address by B. F. Masters at Twenty-third Annual Convention of National Association of Box Manufacturers—Gives Box Makers Food for Thought

It is pleasing to note from our commercial reports and from all sources that we look to for authoritative information in this respect, that there is some improvement in business. I have said before when my predications were not verified, but even so, I would much rather be an optimist and be somewhat disappointed than to be a pessimist and contribute to somebody else's disappointment, because the entire situation in the country to-day with respect to business is not a fundamental trouble but a question of uncertainty of mind, a mental depression if I may describe it that way. The most recent reports that I have had access to indicate that basic commodities are gradually gaining. Steel products, particularly railway equipment, is manifesting considerable strength. Scrap iron may be different. But copper is stronger and the basic metals are stronger and even when you come down to the products that we use, the latest reports that I have seen predict that we have reached the bottom of prices and that lumber cannot be manufactured for the prices at which it is sold to-day and that inevitably one of two things must happen: Costs must be reduced, or manufacturers of lumber will quit manufacturing.

Improve Quality Service

What I have said of lumber is probably true of every industry. It is true of our own industry. I think I may safely say that many of the manufacturers whom I am facing to-day have been conducting their business more upon the hope of the future than upon the profits of the present. I congratulate anyone in our industry to-day who can say that they are making a reasonable profit on their operations. I think we are still in that period of liquidation when we must face the conditions that I have referred to and that it is a question of waiting and holding our trade, giving service, taking care of that which we have and not attempting to stimulate a demand that doesn't exist by quoting low prices that mean ruin to the manufacturer and disappointment and uncertainty to the buyer.

The volume of lumber movement is on a much higher level than a year ago. If that be true, and I have no reason to doubt it, we have no fear of an abundance of raw material for our use. Whether the price may be lower or not seems to me to be of less importance than any other problem we have to meet. My experience, and my observations also, are that our industry is more profitable and is more easily conducted and is less competitive when you are paying a high price for lumber. That is an incongruous suggestion in a way, and I don't mean that we should endeavor to stimulate the advance in the price of lumber, but our business is so closely related to the lumber business and the lumber market that whenever there is any weakness in lumber it is immediately reflected in the product we manufacture, because a great many and probably a majority, in point of production, of the sawmills of the country have shook mills in connection with their operations whose product they will sacrifice much more quickly than they will sacrifice the product of their mill in commercial lumber, due to the fact, perhaps, that a great part of the product that they sell in competition with us is manufactured out of what would otherwise be waste. Short lumber and mill trimmings and low grades of stock which they can cut up at the mill to a better advantage than it can be manufactured into boxes or shooks at some point more remote having to bear the freight rate, the transportation rate on the original character of lumber without the elimination of waste.

To offset any improvement that may have manifested itself up to date, I am going to be a pessimist just for a minute. To offset all this, there are many lines of industry that have not liquidated and I scarcely know what order to take them up in, but I think the retail stores and labor are the two most important. Absolute liquidation in the matter of labor means that every man is working for what he's worth that there is competition for his job and no man can expect to inflate that position and get more than he is worth by any artificial means. The question of supply and demand, the question of his efficiency and the real value of his labor to industry is what he ought to get! Labor must be liquidated, along with some other commodities.

Importance of Cost Reduction

In the past we have sometimes talked about the possibility of improving the condition surrounding our industry by various means, such as advertising (which is commendable and which I heartily approve of,) co-operation (which is commendable but which is somewhat artifical and therefore very often futile) the real essense of what must be accomplished in our industry and every other industry is to do, I will say, two things: Reduce the cost of the product that we are selling, and use a little better judgment in the methods and manner of marketing that product.

Fundamentally, the thing true in every industry as I see it, is the lowest possible cost of production, and that must be brought about by intelligent means. It can't be brought about by co-operation. Sometimes sales may be influenced by co-operation, but back of it all no man is happy who can't make his product as cheap as his competitor. He is not happy neither is he safe, because this period of liquidation and restoration of basic and fundamental principles means that the man who can't make his product as cheap as the other fellow is hopelessly lost before he starts.

There may be some advantages that some of us have that others do not share, but my observation in the past twenty or twenty-five years in the box industry (and I am talking to box men now) is that when you analyze the fundamental conditions surrounding every man's business, you find that we are all very much in the same boat. You have one man beat on one thing and he has you beat on something else and the essence of the business propositions today is to combine all the most efficient methods of

manufacturing, put into effect all the most economical features of production, the best efforts of selling your product. Co-operation is necessary in that. The fundamental adoption of your cost is the thing that is going to count in the future of the box business, as I see it, and in saying that I don't mean that the cost of lumber which will reduce the cost of your boxes is the important thing. It means and is important in connection with the selling of our product in competition with substitute packages (and I still call them substitute packages); it does help you in that, but 75% of the competition that you men meet is not from the extraneous packages or extraneous conditions or circumstances or competition,—it is from within. Maybe you don't agree with me on that it is at least 75% from within.

Is Vital to Future Industry

What I have in mind is that the future of the box industry, whether made up into boxes locally or shooks or whatever it may be, that its perpetuation puts up to the manufacturers, the importance of producing the product that you sell at the very lowest cost of production. I don't mean that you have been extravagant and that you haven't done that. Maybe you have, but I do know that we haven't all liquidated. We haven't all come down to the very finest point and reduced our expenses to the point where it may hurt, may have hurt ourselves, may have hurt our organization, may have impaired our efficiency to some extent in that we have been obliged to say to men in our employ that "under these conditions it becomes absolutely necessary for you to share in the necessary reduction in costs in order to perpetuate this industry."

I know some men—and I love them and admire them for their thought—who say "I can't reduce the wages of some of my men who have been with me for years." I don't want to make any suggestions as to that, but if you can't reduce your cost some way or other, my thought is that you are hopelessly lost and that this industry is going to fail except as to those that will and can reduce their cost. Because we are approaching an era, we are already in a period when everything that is sold, must be sold and is expected to be sold and should be sold at a lower price than it was two or three years ago. Of course, you may say that boxes were sold at half what they were two years ago. Has your cost gone down half? The cost of your material may have gone down half, and to my mind that is the underlying thought that every manufacturer should keep in mind—that he must get his cost of production down in order to perpetuate his business.

Overhead is the whiteman's burden, and us white men have been having to bear it for a number of years. Overhead, ever since business began to decline two years or a year and a half ago, has been the one bugaboo that has put a lot of us on the down grade. You can't reduce your overhead automatically just by a wave of the hand. You can't do it without some very stringent measures at times. This is the thought I have in mind—the survival of the industries whether in the box business or lumber business, whether in manufacturing lines, steel, hardware, clothing, whatever they may be, these basic industries are coming to the point where they see that the perpetuation of their business is very closely correlated with the cost of production and that the reduction in cost is the only safe thing, the only sure means by which they can perpetuate their business.

Insist That Wooden Box is Used

I think it is a shame that any man in the Wooden Box business ever buys anything from anybody to be shipped anywhere without specifying that it must be shipped in a wooden box, and a lot of us do it.

We are all in the same business and in the same boat in the same storm. We are all depending upon the same natural resources for our basis of supply. We are so closely related to the lumber business that the lumber manufacturers look on us and expect us to use that part of their product which is not usable, to a very great extent, for any purpose.

The next step we should take is to impress upon every lumber manufacturer the thing that I have just stated here. We started a campaign of this sort at one time and did a lot of work and we had every lumberman in the country stamping on his orders "This must be shipped in a wooden box," and sometimes "made by————." You can leave that off if you want to.

Putting Up New Factory

J. Walter & Sons, Kitchener, Ont., manufacturers of carved wood fibre ornaments, are erecting a new plant, which is taking the form of a two-storey building, 100 x 200 feet. The capacity of the new factory will be three times that of the old plant, and it is anticipated that employment will be given to, at least, 75 hands. From 25 to 30 are being employed to-day.

One reason for this new development is that this company has been able to work up an unusually large export trade. At the present time about 50% of their output goes overseas, shipments being made to England, Scotland, Ireland, Spain, Germany, France, Belgium, Holland, South America and South Africa. The bulk of the export business, however, is with Great Britain. It is the intention to add several new lines.

The present personnel of this company is,—President and manager, John Walter; vice-president, Edward Walter; secretary-treasurer Arthur Slumkofski, and head designer, Fred. Schmidt.

Millwork Cost Bureau Convention

The Millwork Cost Bureau, of Chicago, held their Eighth Annual Convention at Chicago on April 19th and 20th. The attendance was equal to that of former years but there was a marked increase in the interest and enthusiasm displayed by those present.

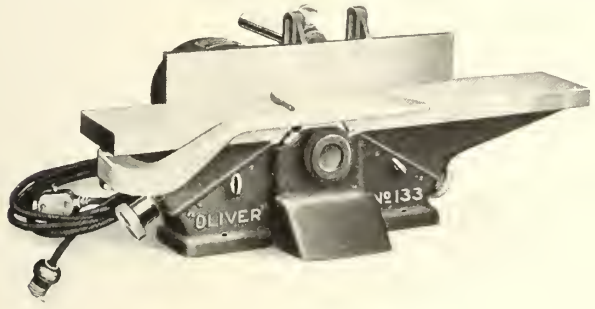
The work for the past year was reviewed by the secretary, W. P. Flint. His report showed that during 1921 the membership had been increased by the addition of 37 new concerns. A number of new services had been put into effect, including "supervision of cost recording," "new correspondence course for estimators" and the "group lecture service."

A number of interesting and practical addresses were delivered, some of the subjects being "Credit Terms and Discounts;" "Should the Special Millwork Plant Buy or Manufacture its Stock Millwork?" Operating the M.C.B. Cost System;" "Proper Mill Equipment and Arrangement;" "Estimators' Clubs and Their Function," and similar topics.

Machinery & Equipment

Portable Hand Jointers

A New portable hand planer and jointer is shown in the accompanying illustrations. This is a product of the Oliver Machinery Co., of Grand Rapids, Mich. This equipment was produced to meet the demand for a compact, motor-driven planer and jointer to relieve the bench hands of an immense amount of hand-planing and hand-fitting. The machine is made for either belt or direct motor drive. In the case of the motor-driven jointer, the motor is connected directly to the shaft or cutting cylinder of the jointer. The bearings are equipped with ball bearings and are carefully guarded and protected from dust and shavings. These machines may be had in either 4 or 6 inch seizes and may be used on the working bench itself or may be mounted on a special floor pedestal. The tables are mounted on incline dovetailed ways and are raised and lowered by means of hand wheel and screws. Provision is made for locking the table in any position. The fence, which is capable of quick adjustment, can be tilted to an angle of 45 degrees and may be shoved out of the way for jointing or



Oliver portable bench jointer

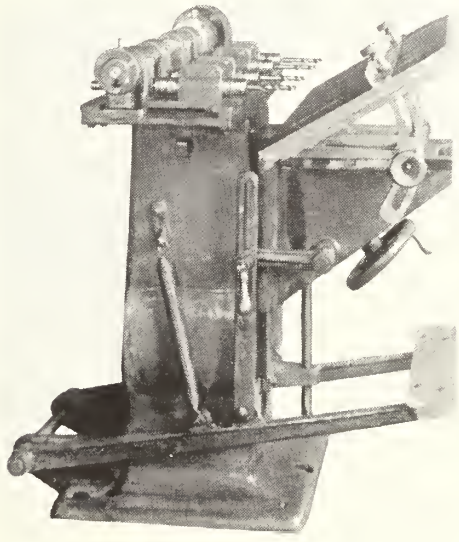
setting the knives. The cutter head is a three-knife circular safety head, fitted with Tungsten Chromium thin steel knives. Cutting diameter of these heads is 3½ inches. The machine is built on a rigid one-piece frame and is so designed and constructed to give long and satisfactory service.

New Horizontal Boring Machine

The horizontal multiple spindle boring machine as illustrated was recently placed upon the market by the Valley City Machine Works, Grand Rapids, Mich. It is built upon a single column and is self-contained, insuring absolute accuracy and ease of adjustment. The half tone clearly shows the adaptibility of the machine to variable center distance, variable depth with equal length bits as well as angular boring. The minimum center distance is 3-1/8" and the maximum 24". The spindle units are self-contained and integral, having hardened spiral gears which run in an oil reservoir. This eliminates any adjustment when changing center distances. These units are equipped with ball thrust bearing spindles in adjustable quills.

The horizontal driving shaft is mounted on three radial ball bearings. The driving pulley can be placed on either end and can be belted from any point around the circle. The number of spindles can be varied to suit requirements and they can be fitted for any type of bit.

The feed is actuated by the treadle counter-bal-

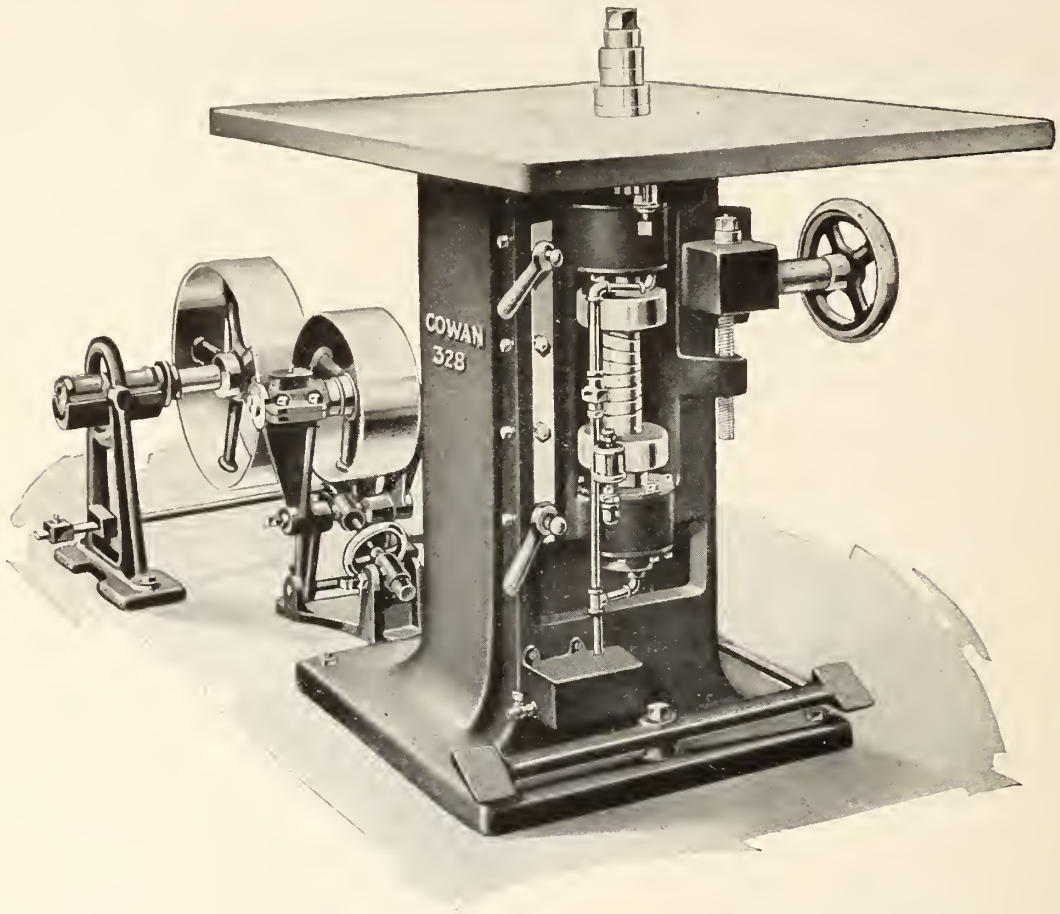


New Multiple spindle horizontal boring machine

anced by the retractile coil springs which gives a quick sensitive response with a minimum of movement and exertion. The table is 16" x 40" and can be fitted with various fences or work-holding devices to suit customer. The machine occupies a floor space front to back of 36" and left to right 44". Weight about 1,200 lbs.

New High Speed Shaper

Cowan & Co., of Galt, Limited, Galt, Ont., recently placed a new ball bearing shaper on the market. This is shown in the accompanying illustration. It is designed to run at a speed up to 12,000 R.P.M. and the frame and construction has been so worked out as to insure rigidity and freedom from vibration. The frame itself is a heavy cored casting, having a wide base supporting a table 32 x 30. A removable throat plate 6 inches in diameter surrounds the spindle. Raised rings or non-friction guides of any diameter can be supplied to replace this throat plate. The spindle itself is of 2 1/8 inch tool steel, turned down to 1 1/8 inch above the shoulder, and is accurately machined and balanced. It is located 16 inches from the front of the table. Bearings are S.K.F., ball bearings and are specially selected for their suitability to this work. They are dustproof and provided with an up-to-date oiling system, having sight feed oil cups. The bearings are independent of the spindle and can be readily removed. The yokes carrying the bearings are heavy and hold the spindle steady and in line. They are raised and lowered in long slides by a hand



High speed ball bearing shaper recently placed on the market by Cowan & Co., of Galt, Limited, Galt, Ont.

wheel and can be locked in any position. Motor drive can be used by belting from motor direct to spindle, using an adjustable belt guide stand. From 2 to 3 h.p. are required to drive this shaper.

All Steel Factory Trucks

What might be considered a decided improvement in factory trucks is the all-steel truck manufactured by the Globe Vise & Truck Co., Grand Rapids, Mich.

View in Brunswick, Balke, Collendar plant showing all steel trucks

The accompanying illustration shows a number of these trucks in the plant of the Brunswick-Balke-Collender Co., at Muskegon, Mich. This is only a few of the 3,300 Globe "metal-light"steel trucks to be found in this large factory. The truck itself is made of blue annealed steel, the top and sides being 14-gauge and the ends 12 gauge. A centre rail or brace which is not visible extends from one caster to another to give greater rigidity and strength. All trucks are fitted with the removable hardwood stakes. One feature of a truck of this kind, that is of unusual interest is that with the smooth steel bed, there is nothing to mar the stock. Sometimes in the case of the home-made truck, the nail heads project above the level of the truck and cause a considerable amount of damage to stock in the course of a year.

Mark Twain on Advertising

Mark Twain in his early days was editor of a Missouri newspaper. A superstitious subscriber wrote him, saying that he had found a spider in his paper, and asked whether that was a sign of good or bad luck. The humorist wrote this answer and printed it:

"Old Subscriber: Finding a spider in your paper was neither good nor bad luck for you. The spider was merely looking over our paper to see which merchant is not advertising, so that he can go to that store, spin his web across the door, and live a life of undisturbed peace ever afterwards."

Upholstering and Trimming

Treatment of Arms and Wings

When not Provided With Removable Panels Resort Must be Made to Welting and Banding

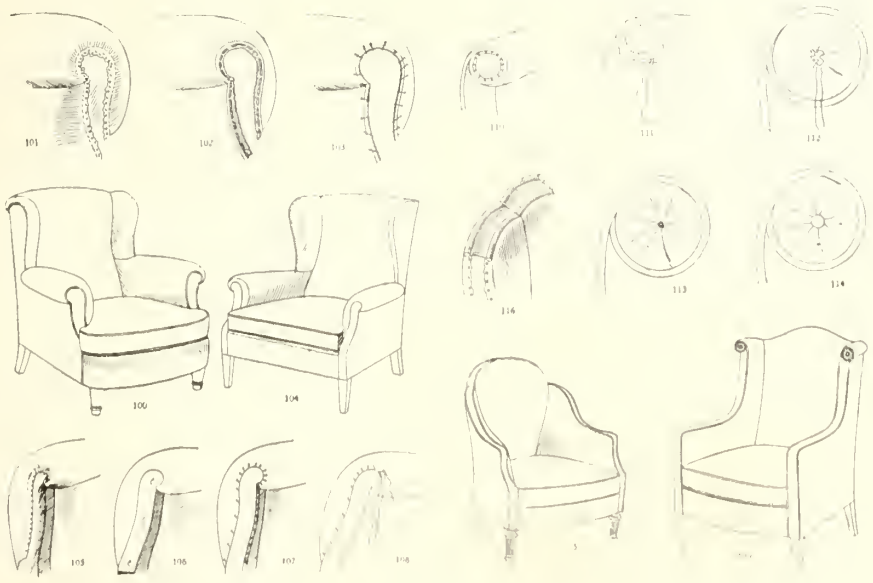
The chair last described in this series, which is being reprinted from the "Upholsterer," was constructed with removable wooden panels, which simplified the finishing of the arms and wings. We now illustrate several styles which, not being provided with removable panels, must be treated in the ordinary way of welting and banding.

The chair shown as Fig. 100 is of the luxurious type, the arm of which is finished with a double welted panel. The welt in this instance outlines the panel and is put on after the outside lining has been attached. Futhermore, the panel is slightly larger than the woodwork of the face of the arm. Fig. 101 shows a double enlargement of the arm, which is the right arm of the chair (as the chair faces the observer it appears at the left of the illustration) with the shape of the woodwork indicated by a broken line.

The welt sewn into place is shown in Fig. 102 following the shape indicated by the outline of the woodwork, but sewn to the upholstering and to the cloth of the outside lining. In order to get the proper shape for this welt, an outline is sketched on the upholstering in chalk, with or without a pattern, and the welt, which has already been stitched by machine, is sewn into place, as indicated. A piece of the covering is then pinned into position within the welt and blind-stitched into place, as indicated in Fig. 103. In the case of a very large welt and a heavy fabric, it is well also to blind-sew around the outside of the welt in order that it may be kept flat and shapely.

The arm shown in Fig. 104 is finished without a welt, a treatment sometimes desirable with a heavy plush fabric. Fig. 105, enlarged to double size, shows the contour of the upholstering of the left arm and the shape of the face of the arm is indicated by a dotted line. Fig. 106 shows the pattern attached to the face of the arm for the purpose of outlining the shape of the panel and a pencil or chalk line is drawn around the pattern where the panel is to be sewn. The panel is next pinned in place, Fig. 107, the outside edge is tacked on the outside arm where it will be covered by the lining and the outline of the panel is blind-sewn where pinned, as indicated in Fig. 108.

A different type of chair having a continuous wing and arm which is treated on the face with a double welted band ending at the top of the wing in a gathered rosette is shown in Fig. 109. The welt, which follows the shape of the wing and the outside arm, is put on after the chair has been upholstered to this stage, and is carried around the circle of the roll, which finishes the top of the wing, as indicated in Fig. 110. The rosette which finishes this circle is the last thing to be put in place, therefore, the band which forms the panel on the face of the wing



Details showing how arms and wings may be finished

and arm is put on so that the welt which follows the circle in Fig. 110 comes over the band.

The band, at this outer edge, is tacked around the edge of the frame where the lining comes on the top of it, making a finished edge, as shown in the illustration. The fabric for the rosette may be either tacked or sewn into place, as indicated in Fig. 111, in either case it is imperative that it follow closely the inside edge of the welt as no other trimming comes between the outside edge of the rosette and the welt.

A gathering string is threaded through the flat edge of the fabric which composes the rosette and drawn tightly together, gathering the fabric into a close knot and completed by a button, as shown progressively in Figs. 112, 113, 114. Fig. 115 shows the type of chair which may be trimmed by a double welted band mitered at the angles to fit smoothly and blind-sewn on both edges, as indicated in Fig. 116, to make the finished trimming. It will be obvious that in order for this type of trimming to be effective, it must be very neatly made with welts that are absolutely parallel and neatly applied in conformity with the shape of the upholstering and the outlines of the chair. It is illustrated here not only as the only method of trimming for the chair shown, but as an example of a treatment which may be applied to this type of chair and to others of a similar shape where one continuous band may be used for the back and arms.

What is Your Reputation Worth?

S. Karpen & Brothers Find That Integrity and Reputation of Manufacturer Biggest Factor in Selling Upholstered Furniture—Dealer Forced to Rely Upon Honesty of Producer—Every Effort to Maintain Quality

In no class of furniture does more depend upon honest and thorough factory methods than in the making of upholstered furniture. The integrity of the manufacturer is a big and commanding element.

So much of the quality of upholstered furniture depends upon factors that are not visible to an outward inspection, that this dependence upon the manufacturer looms larger and larger upon deeper consideration. Beneath the covers of upholstered furniture there must be an honest construction all the way through. Otherwise, no matter what may be the attraction of outward appearance, the davenport or chair will not be satisfactory in use and service.

Value Lies in Honest Construction

A trip through the mammoth departments devoted to the manufacture of upholstered furniture at the great factories of S. Karpen & Brothers is a demonstration in the right kind of factory methods that produce that Karpen quality which stands for so much in the furniture industry. Observation of operations in these departments emphasizes the statement that the value of upholstered furniture lies in its honest construction in every part. Expert workers are seen busy at their particular tasks and the constant and exhaustive inspections of every operation makes perfection absolutely sure.

Somehow, there appears to be an especially noticeable degree of craftsmanship and pride in work among the men and women in these departments. It seems that these workers realize the importance of their work and their work gains that indescribable quality that comes only from true appreciation of the importance of good craftsmanship.

One pauses in the department where the frames are constructed, his attention held by the precision with which the work is done. A sturdy, strong and inflexible frame is the foundation of the davenport or chair and without a perfect frame all the embellishments would be lost effort. The frame must be right, there can be no compromise of any kind.

Every Detail Must be Considered

The value of an upholstered davenport or chair lies largely in the way the springs are put in and the manner in which the materials that make it soft and comfortable are placed in position. At first glance one judges an upholstered chair or davenport by its appearance, but the final judgment of its worth comes only after one has sat down in it and measured its comfort. This comfort, and how long the piece will possess this comfort, are determined in the departments where the springs are put into place and where

(Continued on page 98)

Eagle-Ottawa Leather Co.

TANNERS OF

FURNITURE LEATHER

OF EVERY DESCRIPTION

We are making a specialty of cutting

Spanish Split Leather for Chair Manufacturers

Quotations and samples furnished on application

We will be pleased to supply a very attractive sample book, of all our grades on application.

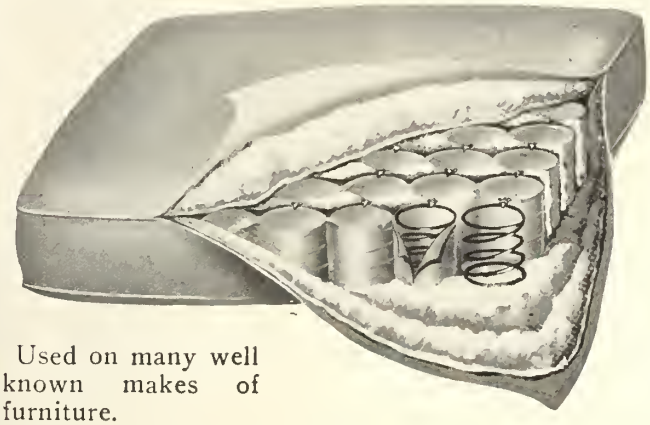
GRAND HAVEN - - - - - MICHIGAN

"COMFY" CUSHION COMPANY

Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.



Used on many well known makes of furniture.

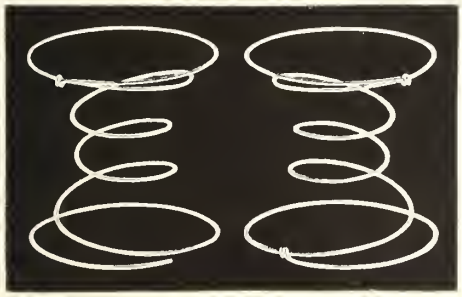
Write for Catalogue

"Comfy" Cushion Co.

340 Gerrard Street, East, TORONTO, Can.

"IDEAL"

FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,

of Canada, Limited

Windsor - Ontario

The

ORIENTAL TEXTILES COMPANY

LIMITED

Oshawa, Ontario

Manufacturers of

Upholstery
Mohair
and Velours

Agent

J. H. ALLEN

33 MELINDA STREET

TORONTO

Twines and Cordage

"Doon" Twines are known throughout the woodworking industry for their absolute dependability and uniform quality. They are entirely "made in Canada."

Spring Twines, Stitching Twines, Seaming Twines, Tufting Twines, Wrapping Twines, Flax, Hemp and Jute Twines for all purposes.

Write for samples and prices.

DOON TWINES, LTD.

Mills at Doon and Kitchener

Head Office: Kitchener

ENAMELS and UNDERCOATS

Marietta Enamels are made in any grade desired to suit the requirements of any customer.

Marietta Undercoat possesses the following qualities:

Extreme fineness.
Easy flowing properties.
It is long in oil.
It will not peel.
It dries hard over night.

Liquid not paste—consequently sprays well, enabling the sprayer to cover more surface in a given time.

Samples to furniture manufacturers on request.

The Marietta Paint and Color Co.

Marietta, Ohio

D&P

CURLED HAIR GLUE SANDPAPER

DELANY & PETTIT LIMITED

TORONTO.

OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC

Why Filler is Applied

Does More Than Fill Pores—Points to Consider in Selecting Your Filler

By A. J. Wright*

The use of wood filler has two purposes. First, it fills the pores of the wood and builds up a level surface to receive the following coats. Second, it brings out the beautiful workings that nature has made in the wood. While the furniture manufacturers have been striving to bring out new styles and designs, the filler manufacturers have been endeavoring to develop their fillers to take care of the demand for new finishes.

Filler can be obtained either with or without stain combined. That is transparent fillers or stained fillers. By transparent I do not mean natural filler but fillers in oak, walnut or mahogany. For light-grade work, much better results can be obtained by first staining the wood and following with a filler of the corresponding color. The stain should always be darker than the filler or the filler is apt to give a milky cast. In selecting a filler it should be borne in mind that there is a wide difference in fillers. The best filler is made from selected silex, that is, a silex obtained from crushing crystal quartz. This is a much finer grade of silex than in ordinary use, due to the fact that it is clear and does not throw off the shade of the coloring. In addition this silex is needle-like in structure and packs into the pores of the wood very readily. The green tone sometimes seen in natural oak finish is caused entirely by the fact that the silex is not clear.

The most important part of a filler, however, is not the silex, as silex has been used in making filler for years. The liquid portion of a filler can spoil the best silex obtainable and make a very poor filler. The most common complaint in fillers is shrinking in the pores of the wood after varnish has been applied, and this is caused by the vehicle not drying hard to the bottom of the pores before the surface is finished.

The drying of a filler depends on the Japan used. This is not an ordinary Japan but a special piece of goods developed for this class of work. A filler should dry hard in the pores of the wood in twelve hours instead of only on the surface. It should be made soft and should not be thinned any more than is necessary to work it properly.

If the veneer is running good, one filling thoroughly rubbed in is sufficient. However, if the filling department is on a piece work basis, it is advisable to fill twice to insure proper filling. A wash coat of shellac applied before the filler makes a good foundation for the filler as it stops all absorption by the wood.

When a shipment of filler is received, always try it out before putting it into production, as a great deal of expense can often be avoided in this way. The filler may not suit the stain you are using and one or the other will have to be changed. In examining a test of filler, always hold it in the direct sunlight. This is essential in the case of mahogany as cloudiness does not always show in the ordinary light of the shop. A good filler makes a smooth even surface for the varnish coats. Great care should be taken to clean off the superfluous filler on the wood.

While the filler emphasizes the markings in the wood and makes visible tracings that would not otherwise be seen, at the same time it also makes any defects stand out prominently. These, of course, can be taken care of in the shading.

It is strongly recommended in obtaining filler to secure it from a manufacturer who understands the requirements of the furniture trade and whose filler receives the proper supervision both as far as the raw and the finished materials are concerned.

*Flint Varnish & Color Co., of Canada, Limited, Toronto.

Overhead Carriers in Finishing Room

One trend of development in finishing room equipment is toward overhead carrying systems for moving the stock through this important department. This applies particularly to plants who handle a large volume of small parts. By installing overhead tracks having suitable carriers, the small parts may be hung on racks and moved from one operation to another with a minimum handling and effort. In addition considerable time is saved in performing the various operations. In one plant an overhead track was dropped so that it ran into the spraying booth and the varnish applied to the pieces while they were hanging from the carriers. This meant quick work, for the operator did not have to handle the articles at all.

Another feature worthy of mention is that the pieces have a better opportunity to dry when they are suspended from the ceiling in this manner. It gives the air a chance to circulate freely about each piece, resulting in quick uniform drying. If varnish-drying kilns are used, the tracks could run right through the kiln and the work be put in and removed with a minimum of labor.

Finishes in Strong Demand

At the furniture exhibition recently held at Evansville, Ind., the two most popular finishes for dining room furniture were dusty oak and dusty walnut. It is stated that the manufacturers in that district were unable to produce stock in these two finishes fast enough to take care of the demand. Next to the dusty finishes, furniture showing a combination of shades was, probably, the most popular. This latter finish, which is sometimes called "duo tone," seems to be fast gaining in public favor. This holds true, not only of the Evansville market, but applies to all American furniture centres. Solid walnut bedroom furniture was another line which found great favor on this market.

Checking Volatile Thinner in Oil Varnishes

Describing How Percentage of Various Thinners in Oil Varnishes May be Determined

S. W. Stratton*

Almost all oil varnishes (varnish containing lined oil and rosin) as thinner, gum spirits of turpentine, "mineral spirits," (petroleum distillates) or a mixture of the two. Most of the turpentine substitute prepared for use in paint and varnish are made from mineral oil. Benzene ($C_6 H_6$) carbon disluphide, alchol, and wood turpentine are very rarely used for oil varnish, though wood turpentine is frequently used in the manufacture of driers.

The definition for "volatile thinner," proposed by committee D-1 of the American Society for Testing Materials, is as follows: "All that liquid portion of a paint, water excepted, which is volatile in a current of steam at atmospheric pressure.

Since there has appeared no published work in which different methods for the determination of volatile thinner have been compared by the analysis of samples containing turpentine and of samples containing mineral spirits, this investigation was undertaken in order to ascertain the accuracy and convenience of the different methods.

Collection and Preparation of Samples

Two samples of varnish were obtained from a reliable manufacturer, one being made from rosin, linseed oil, Chinese wood oil, driers, and "mineral spirits," and the other from a hard gum, hardened rosin, linseed oil, Chinese wood oil, driers, and turpentine. These samples are subsequently designated as A and B, respectively. An example of the distillate obtained from B showed that it contained a very small amount (about .2 per cent) of "mineral spirits." Two samples of varnish were prepared in the laboratory, the nonvolatile portion of both consisting of approximately equal parts by weight of calcium resinate (prepared by heating rosin with 5 per cent of its weight of slaked lime) and boiled linseed oil (containing lead and manganese.) In one case the thinner used was turpentine, and in the other light mineral oil. These samples are designated as C and D, respectively. Examination of the distillates obtained from A and B and of the thinners used to prepare C and D gave the results shown in Table 1.

Table 1

Results of Examination of Thinners

Material	Specific gravity at 15.6° C.	Refractive index at 20° C.	Unpolymerized residue %	Refractive index of unpolymerized at 20° C	Initial boiling point °C	90% distilled at °C	95% distilled at °C
Pistillate from A	0.763	1.423			119	173	187
Distillate from B	.864	1.470	2.5	1.473			
Thinner used for C	.869	1.471	1.2	1.513			
Thinner used for D	.761	1.425			118	178	190

*Bureau of Standards, Washington, D.C.

The distillation was made with an, Engler apparutus.

The light mineral oil that was present in A and D is fairly representative of mineral-oil varnish thinners.

Different Methods Used

Four methods were used for the determination of the amounts of volatile thinner in A, B, C and D.

Method 1. — A steam distillation was made, using 100 g of varnish, the still containing the varnish being heated to 115-120 degrees C in an air bath. The distillation required from one and one-fourth to one and one-half hours and the volume of water condensed varied from 550 to 700 cc. The distillate from the varnish was separated from the water and weighed. The "corrected" results (see Table 2) were obtained by adding to the weight of the volatile thinner 0.3 g for each 100 cc of water condensed.

Method 2. — Approximately 1 .5 g of varnish were placed in a stoppered glass vial and the vial and contents weighed. The varnish was poured into a weighed metal dish, having a circular flat bottom 8 cm in diameter, the stopper was replaced, and the vial and stopper weighed. The dish was heated in an air bath at 110-115 degrees C until no further loss in weight occurred. The maximum time required was three hours. The loss was assumed to be volatile thinner.

Mthod 3. — Brown's method, with A and B a mixture of ether and chloroform was used, but C and D dissolved readily in ether. The films obtained were very uneven, being thickest at the edges of the plates. The plates were placed in a dust-free glass-walled cabinet with free access of air. The plates were weighed at intervals until no further loss occurred. The maximum time required was three hours. The loss was assumed to be volatile thinner.

Method 3a. — This was the same as Method 3, except that the plates were kept in a current of illuminating gas. The maximum time required was three hours.

Determination of Thinner in Varnish

Method 4. — A small stoppered vial containing about 1 g of varnish and a small camel's-hair brush were weighed together. The contents of the vial were poured upon a weighed glass plate, 10 by 15 cm, and brushed out to a thin film. The stoppered vial and brush were then weighed. The films of varnish weighed 0 .6 to 0 .9 g. The plates were allowed to stand in the cabinet used for Method 3 and were weighed at intervals until no further loss occurred. The first weighing was made at the end of two hours and subsequent weighings showed that no further loss occurred in any case. The loss was assumed to be volatile thinner.

The temperature of the room during the determinations by Methods 3, 3a, and 4 varied from 30-35 deg. C. The results obtained by all methods are shown in Table 2.

The uncorrected results obtained by method 1

and those obtained by methods 3, 3a, and 4 are all as concordant as can be expected. It was also to be expected that slightly higher figures would be obtained by method 3a than with method 3. The percentages of volatile thinner in C and D obtained by method 1 (uncorrected) and by methods 2, 3, 3a and 4 are but slightly less than the amounts actually present and the corrected results by method 1 are but slightly greater. It appears, therefore, that for such varnishes the most convenient method may be selected for routine use. During the application of varnish the thinner is rapidly evaporating, so that for practical purposes an error of 1 per cent in the determination

Table 2

Results of Determination of Volatile Thinner by Different Methods.

Method	Sample A, mineral spirits.		Sample B, turpentine.		Sample C, 50.1 per cent		Sample D, 53.9 per cent mineral spirits present.	
	Found Per cent	Mean Per cent	Found Per cent	Mean Per cent	Found Per cent	Mean Per cent	Found Per cent	Mean Per cent
No. 1	50.0 49.2 51.7	49.6	52.5 53.5 54.4	53.0	48.9 49.5 51.0	49.2	52.7 53.0 54.7	52.9
No. 1 (corrected)	51.3 49.1	51.5	55.4 52.9	54.9	50.2 50.0	50.6	54.9 53.3	54.8
No. 2	49.6 48.7	49.4	52.7 51.8	52.8	49.2 49.3	49.6	52.3 53.4	52.8
No. 3	48.7 48.6	48.7	51.0 52.	51.4	49.0 49.2	49.2	52.8 53.0	53.1
No. 3a	49.3 49.1	49.0	52.2 52.8	52.4	50.0 49.5	49.6	52.9 53.3	53.0
No. 4	49.1	49.1	52.6	52.7	49.6	49.6	53.4	53.4
Mean		49.5		52.9		49.6		53.3
Maximum deviation from mean	x2.2	x2.0	x2.5	x2.0	x1.4	x1.0	x1.6	x1.5
Maximum deviation from known					-1.1	-0.9	-1.6	-1.1

is of no significance. In this laboratory method 2 is used, the result being reported as the whole percentage next above the figure obtained. Should the steam distillation method be used, with subsequent correction of results, the percentage of volatile thinner should be reported as the whole percentage next below the figure obtained. In the examination of samples of interior, floor, coach and spar varnishes panel tests and drying tests on glass are made separately instead of in connection with the determination of volatile thinner as is suggested by Brown. The distillate obtained by steam distillation of an unweighed portion of the varnish is used for the determination of the nature of the thinner.

The practically complete volatilization of the thinner in a short time as obtained in the determinations by method 4, indicates that with such samples it is highly improbable that the nature of the dried film, or the rate of drying, is influenced by the nature of the thinner. These samples, however, were analyzed shortly after preparation, while some varnishes of high quality are aged, sometimes for years, before being marketed. In aged varnishes it is probable that turpentine changes so as to yield nonvolatile material, which remains in the varnish coat when the film dries. The changes in the volatile thinner contents of varnishes on aging is under investigation in this laboratory.

Building Actively Continues to Increase

The building industry in Canada continues to forge ahead at a very gratifying rate. This is particularly true of residential work. The figures for April 1922 indicate that the value of the contracts awarded for residences during April totalled $12,472 00. The significance of this is seen by comparing this amount with the figures for recent years which are,—April 1921, $9,000.000.; April 1920, $6,500.000.; April 1919 $3,000,000.

This building boom, if such a term might be used, is responsible for the large volume of business being handled by the sash, door and planing mills. Many of these plants are operating to capacity and are unable to take care of the volume of business being offered. By fall the beneficial effects of this situation should be felt by the furniture manufacturers, and it should go a long way to placing production in furniture plants on a basis which more nearly approaches normal.

The trend of building costs is slightly downward, which may be taken as an indication that the activity in the building field will increase from month to month rather than show signs of a decline.

Utilizing Box Factory Waste

There is considerable waste in the production of boxes and box shooks, and in order to utilize this to the fullest possible extent, the Pacific Box Co., Vancouver, B. C., has developed and equipped an up-to-date pail factory. All the short ends of box stock not available for boxes, are sent to the pail-making machines. The stock for the staves is grooved out then taken to the jointing machine where it is jointed and tapered so as to give the correct flare, together with the required top and bottom diameters. After being jointed, the staves are cut to length and placed on a setting-up table where they are set up in the form of a circle and one hoop put on. The next operation is turning off the outside of the rough pail and sanding it to a smooth surface. A groove is also cut in the inside near the lower edge to take the bottom of the pail. While the staves were being made and assembled, other machines were busy turning out the bottom pieces. After the outside has been turned and smoothed, the pail is put on another lathe and the inside dressed up and the bottom put on, then a second hoop is put in place.

These hoops are made of wire and welded together. A piece of wire of the proper length is bent in a rough circle and the ends are placed close together in a device fastened to a suitable bench, and are held in place by a pair of clamps. An electric switch is then thrown in and the ends of the wire become white hot and welded together, making a solid band.

From then on it is just a process of finishing and attaching the bales and handles. In some cases the outside of the pails are varnished whereas for other commodities they are required in the white. There is also a difference in the tops and fastenings used, depending altogether on the material for which the pails are intended.

When you wish to put down a machine close to the shafting so it is a very short drive, don't use a belt, use a chain.

Labor Turnover Costly Item

Labor turnover represents a definite, though not easily calculable loss. This loss is made up, in part at least, as follows:

(1) The clerical cost in incident to firing and replacement.

(2) The cost of training newly hired employees.

(3) The wasteage, breakage, and so on, attributable directly to inexperience.

(4) The maintenance of idle machinery and equipment while separations are being replaced.

(5) The decrease in the general efficiency in the organization due to the constant state of flux in the working force.

(6) The tendency on the part of new employees to increase the frequency and severity of accidents.

Does a saw cut better with teeth ½ in. from point to point, or 2 in. from point to point? Speed of saw 9,000 on tooth.

Belts run on machines with automatic belt tighteners do not require any dope, but attention that the strain put upon them does not injure the bearings.

Some mill floors remind one of obstacle races. Sacks, short ends, sawdust and chips, are only a few of the items the men have to get over to do their work.

Some old-time machinist would have welcomed the no belt machine. They spent a lot of time patching up old belts.

The machine that can make two holes with one operation instead of one is lowering labor and power costs.

The art of making a saw cut so it will leave the end of a block perfectly smooth is entirely different from that of sharpening a log band saw.

Will the tendency in the future be in the direction of joining various machines so that the woodworking process on an article is a continuous one?

Several of the latest safety guards over the cutter blocks of surface planers seem to be very effective and very useful in aiding the operator to turn out good work.

Some men are so thorough in their work that, if the knife on a 24 in. planer come across a nail, they will grind those cutters down so that the gaps made by the nail are gone. Don't waste metal like this, shift the cutters so that each cutter regulates the other.

We saw in a trade paper a suggestion that small band saws should be hammered on the back so that the strain should come on the front. May we suggest that if you want to use those saws to be careful with such hammering. Small band saws are easily spoilt.

In cleaning out a boiler, if a good packing is used for making the manhole joint it can be used several times if care is taken when breaking the joint.

Considering the small amount of extra cost and the lengthened life of a belt, we wonder why so many men will cut down the width of the belting just to save a few cents.

Horizontal band resaws seem to be very effective and up-to-date machines.

when the gullet of the teeth of a saw is not large enough to carry the dust it packs against the wood and the saw.

Burden as Factor in Lumber Cost

A woodworker was recently asked what lumber costing $50.00 per M should be sold at to bring a profit of 10%. His reply was $72.60. He went on to explain that in arriving at this figure, he added $5.00 per M for lumber burden and then an additional 20% to cover the commercial burden, which brought the total cost of the lumber up to $66.00, and then by adding 10% for profit it made the resale price $72.60. This woodworker intimated that sometimes a serious error is made by not adding all cost items, such as overhead and handling charges before calculating the profit percent.

In selling this stock at $72.60, he is not making 10% on the resale price but only 10% on the cost price. To make a profit of 10% on an item of this kind, it would be necessary for him to sell the stock at $73.33.

Repairing Dents in Finished Surfaces

Sometimes the finisher is called upon to repair damaged spots on veneer surfaces. If these take the form of dents, it is advisable to soak them with warm water so as to swell the wood before applying any form of filler. After the spot has been soaked and the moisture has had a chance to dry out, then the hollow may be filled with some form of crack filler such as stick shellac and the finish proceeded with in the usual way.

Profits often arise from leaks that are stopped.

"ENAMELS"

Our business in both White and Old Ivory Enamels and Primers has trebled during the past year.

WHY?

They are the best on the market. If you are not using them, write for samples and prices.

The Ault & Wiborg Co. of Canada, Ltd.

Varnish Works

Montreal Toronto Winnipeg

E. T. CARTER & CO.

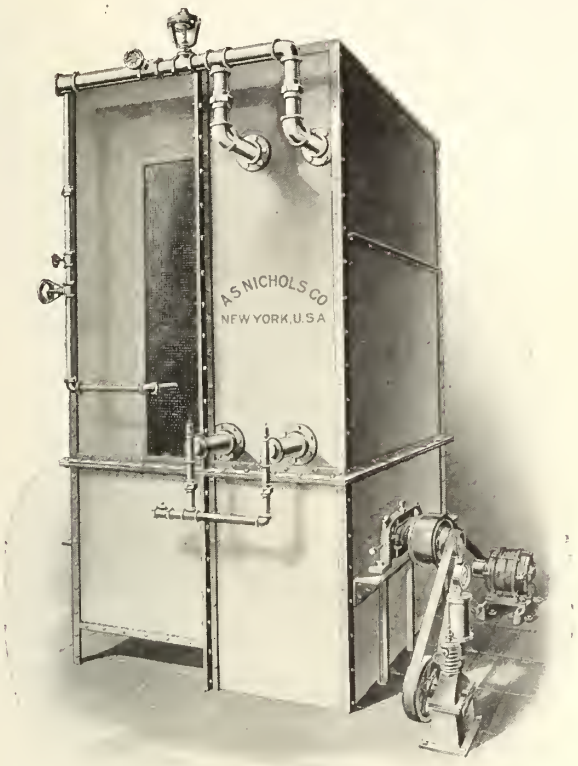
84 FRONT STREET EAST

TORONTO

Dealers in

Fibro Products, Linters, Reeds, Rattans, Waste.

Quality Guaranteed. Prompt Shipment



Vertical Equipment Floor Space 4 x 6 ft.
Crated and shipped complete ready to set on the floor outside of your varnish room

Set Outside Your Varnish Room

The money a Nichols Paint and Varnish Dryer saves will pay for the equipment in one year.

This is not a wild statement but one we have proved time and again to manufacturers in practically every branch of the woodworking industry.

The Nichols Vertical Paint and Varnish Dryer is a complete unit of fan, motor, heaters, air compressor, with automatic humidity and temperature controls. A new rotary, humidifying air washer which eliminates all dust and dirt and does away with all spray heads, pump and connecting piping.

The equipment is manufactured in sizes suitable for all requirements.

Let us analyze your particular needs and quote prices on same.

A. S. NICHOLS COMPANY

Aeolian Hall

33 West 42nd St., New York City

Manufacturers of dryers for lumber, veneers, glued stock, varnish, paints, enamels, etc.

Increasing the Speed and Decreasing the Cost of Your Finishing Room Operation

How practical, how advantageous and how dependable DeVilbiss Spray-painting equipment is, has been demonstrated in finishing rooms of every size and line.

Not merely in dozens of finishing rooms, but in thousands of them. Not only where a few different kinds of articles are handled, but where every kind, size and grade of wood or metal product is finished. Not alone where varnishes, enamels or lacquers are used, but where every kind of liquid finishing material is applied. The

DeVilbiss
Spray-painting System

offers a complete, adaptable and guaranteed service. The finishing operation is speeded up 4 or 5 times over hand-brushing. A perfect, uniform coating is applied on all jobs. Working conditions are made more healthful and safer. Operating and upkeep costs are reduced to the minimum.

With your consent, we'll gladly tell you whether and how the DeVilbiss System can be of service and profit to you.

The DeVilbiss Mfg. Co.

3718 Detroit Ave. ***Toledo, O., U.S.A.***

Paint your factory walls faster and better with the DeVilbiss Spray-painting portable equipment. Let us explain.

Beauty is Durability
THREE hundred years ago, violin makers of Cremona picked the most beautifully grained spruce and maple for their work. These men never failed to choose the finest of even grained wood—for the sake of beauty?—yes, but first for the sake of durability. Experience taught them that a blemish in the grain of the material too often produced uneven vibration causing "wolf" notes which ruined the instrument.
Use Birds Eye Veneer and avoid the "jarring notes" of imperfection that not only mar the appearance but compromise the durability of otherwise beautiful furniture.
BeVeCo VENEERS
BIRDS EYE VENEER COMPANY
ESCANABA MICHIGAN

Veneers and Panels

Glue Room Economy and Technology

Proportions of Glue and Water and Consistency of the Glue Important—Correct Temperatures to Use

By R. H. Bogue*

Interesting Series of Articles

This is the first of an interesting and instructive series of articles dealing with the use and application of animal glue. The author, R. H. Bogue, an Industrial Fellow of the Mellon Institute of Industrial Research, has devoted several years to intensive research work on animal glue, its properties and how it should be prepared and handled to secure the best results. It will be seen, therefore, that Mr. Bogue speaks with a certain amount of authority and knowledge. In these articles are offered ideas and suggestions which if followed should enable any glue user to improve the efficiency of the gluing operation as well as effect savings in other directions. While animal glue is used in almost every woodworking plant it is usually bought blindly and handled in a very haphazard manner.

There is in common practice in many glue rooms so much waste of material, so much loss of energy, so much ignorance of the basic principles of glue handling, that the executives of every glue-consuming plant would do well to take steps to assure themselves positively whether such practice prevails in their own domain. While the trained mechanical or electrical engineer is employed to develop modern efficiency and to scrap unsound practice in other departments of the plant, the glue-room foreman has been left, for the most part, severely alone to rule over his province with whatever of business or scientific efficiency or of indifference he may elect. Since the average glue foreman has learned his trade at the hands of older glue foremen it is not surprising that progress has not been as rapid as should have been expected in this department.

Preparation of the Batch

The only way to overcome this hereditary prejudice is by a system of deliberate constructive education of the glue workmen. Not by means of books: technical or scientific literature make little impression, but by the employment of a few comparative tests which he may see and appreciate. A few of the special precautions that should be introduced are set forth in the following paragraphs.

Many glue workmen make up their batch of glue by measuring out a number of buckets or barrels of glue and adding to that a number of buckets or barrels of water. This procedure may result in a considerable variation in the concentration of the liquid glue resulting. Glue is marketed in a number of different forms: as sheet glue, flake glue, ground glue, etc., and each of these in turn may be made in thicknesses varying from about a fiftieth to a quarter of an inch. Where the glue is made very thin, a 12 quart pail full of the flake will weigh only about 6 pounds, while in the very thick cut material the same volume will weigh up to 15 pounds. In the case of ground glues the variation may be from about 12 to 21 pounds. Obviously, if a foreman who had been using a medium thick cut glue was supplied with a thin cut material, his pail, now holding a smaller weight, would measure off for him a smaller concentration for his liquid and, if the glue was of the same grade as formerly, all of the tests resulting would of course, be low.

But even in the measuring out of glue from the same barrel the weights are apt to vary as much as two pounds in a 16 quart pail, which shows that consistent work cannot be accomplished by measuring, even under the most favorable conditions. The most favorable concentration by weight should be determined once for all for a given grade of glue and a given service, and it should then be insisted upon that all batches should be made up by weight—so many pounds of glue to so many pounds of water.

Consistency of Glue Very Important

There has been no standard of optimum consistency or body of a glue that would produce the best results yet proposed. Each house has its own conception upon this point. In the absence of more definite information, however, it is safe to say that many glue workmen use solutions of too high a viscosity. The glue is too thick oftentimes to properly penetrate the pores of the wood, and at the same time it sets too rapidly. A higher dilution, keeping the temperature at 140 degrees F., would result many times in better penetration, slower set, and in general more satisfactory results, in addition to a lowering of the cost per square foot of area covered. A soft porous wood cannot, however, stand as great a dilution as can a denser wood, on account of the rapidity with which the thinner solution would be soaked up in the former instance.

In making any test upon the spreading capacity of a glue, attention must be given, not only to the actual weight of glue in a given weight of water, rather than a volume relation, but also very carefully to the temperature of the test. The viscosity increases very rapidly with every decrease in temperature, and while a 40 per cent solution, for example, will produce a desirable viscosity at 158 degrees F., a 35 per cent solution would be sufficient at 140 degrees, and if the temperature were allowed to go to 104 degrees a 25 per cent solution would produce the

*Industrial Fellow, Mellon Institute of Industrial Research.

same consistency. The tests are best taken always at 140 degrees F.

Soaking Assists the Melting Process

Unless special precaution is taken to insure the complete covering of the glue by the water during the soaking process, some of the glue will very often extend above the water and not become softened. In the case of thin cut bulky glue this is very often the case, the water sometimes covering only a half or less of the material. Upon warming a batch of glue prepared in this way the unsoaked portion will resist the action of the warm liquid and a greatly prolonged heating, or an excessively high temperature, is necessary to bring it all into solution. And such heating has been shown to result in extensive loss due to the hydrolyzing action of the water.

To overcome this difficulty the glue may be added in portions, the first portion being swollen before the second is added, or the whole mass may be turned over, the top being placed on the bottom. In the case of ground glues the entire batch of glue should be stirred into about three quarters of the water required, and after soaking for a time the balance of the water added. This procedure prevents any of the light flakes from floating on the water and so not being properly soaked.

The temperature of the water should not be high, for above 68 degrees F., the bacteria may become active. A temperature down to near the freezing point does no harm but an actual freezing of the swollen glue is probably harmful. If flake glue, or any very thick material is used, the glue should soak for 10 or 12 hours, but if ground glue is employed, an hour or two is usually sufficient. In either case the flakes of glue should be completely swollen, and not show any hard places, as these will not be easily dissolved.

The water used should be as pure as is practicabally obtainable. Acids or alkalies in water, dissolved salts, or suspended material, each exert an effect upon the gelatin or other constituents of the glue, and undesirable results may be obtained from this source. The bacteria in contaminated water may be the cause of unusually rapid spoiling of a batch of glue.

Temperature Should Be Tested Not Guessed

Heat may be applied to the swollen glue in a number of ways. The most advantageous method, however, is to apply steam to an outer jacket in which the glue container is placed. The glue should be stirred slowly during solution, and the temperature not allowed to exceed 150 degrees F. The water in the outer jacket should not at any time exceed 158 degrees F., and after solution is complete the temperature in both sections should be adjusted to 140 degrees. A thermometer is indispensable, for without its use the temperature cannot be correctly gauged or controlled. The kettle should be covered to prevent evaporation, and the glue is best delivered into the workmen's pots by means of a cock placed near the bottom of the kettle. Only that amount of glue which will be used within two or three hours should be kept in the glue kettle. Properly soaked, glue may be brought into a condition ready for use in a few minutes, and the saving in the strength of the glue warrants this procedure.

Another method of operating that is employed in some plants is to make up the glue into the form of a concentrated jelly, and to distribute this jelly to the workmen as needed. The workmen add a given amount of water to a given weight of jelly, warm it over their bench heater, and it is then ready to apply. While this procedure reduces to a minimum the loss due to prolonged heating, it produces conditions which, unless very carefully controlled, are favorable for the rapid development of bacteria, and large batches of jelly are apt to spoil before being used up. If the jelly is kept in an ice box this danger is averted, and very satisfactory results may be secured.

(Continued in June issue)

What the Furniture Store Tells

A Stroll Through a Furniture Store Might Prove a Revelation to Many Furniture Manufacturers and Suggest Where Manufacturing methods are Weak—Many Faults Would be Found

By R. C. H.

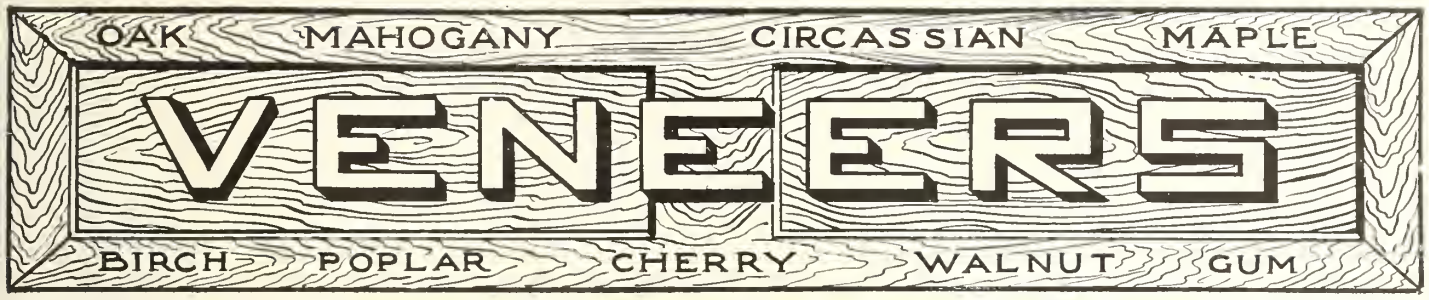
It would be much more pleasant for me to tell about some of the nice things that I saw as I strolled through a large furniture store in one of our large cities, but that would not accomplish the purpose which I have in view, i.e., drawing attention of furniture workers to a few matters in connection with their work that should be corrected. Many defects that are seen in furniture after it has reached the retailer have developed after the goods left the factory. Very few concerns have so little regard for their reputation that they would knowingly send out goods in the condition in which I have seen them on display.

It is a fact that every person passing through a store does not notice defects in furniture, and may buy a defective article and have it in his home for some considerable time before noticing anything wrong—perhaps never discover the defect if somone does not point it out; but once discovered, the article at once loses much of its value to him, if it does not become a positive eyesore. These defects, no matter when or where discovered, usually, if not always, have their inception somewhere in the early stages of construction of the article.

Laid Wrong Side Out

Before us was a buffet with paneled doors, the veneer of which was mahogany stripe, cut and matched so that the strips in each piece met and formed a V. One side of the panel had the veneer laid with the right side out and the other wrong side out, to form the figure. I have sometimes thought that I am overtrained in detecting defects, because if there are any I am certain to see them first, and then all the beauty of the article is spoiled for me. I at once noticed that these panels were defective, and, feeling that way, I waited to see if my companion would discover what I had seen. Soon she pointed

(Please turn to page 92)



THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, — — CINCINNATI, OHIO.

Buyers of Veneers and Panels

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in this publication. They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend his time and money to get in touch with you. He deserves it—if his stock and prices are right.

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.

(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

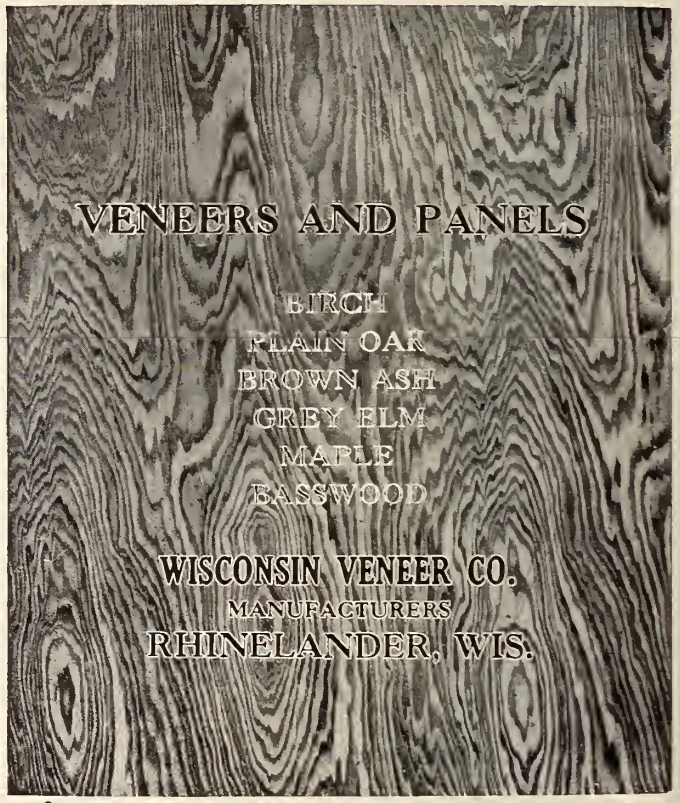
Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.



Litton Veneer Co.

Office and Mill Rockford, Illinois

Manufacturers

American Walnut Veneer and Lumber.

Plain and Figured Veneers of All Kinds.

Grand Rapids Office & Sample Room
5-7 Ionia Ave., S.W.
In charge of HUGH L. CURREN

J.W.Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specializes in

Walnut Lumber and Veneers
Oak Lumber and Veneers
Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Poplar and Walnut

Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND

HOFFMAN BROS. CO.

ESTABLISHED 1867 INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car 1/20′	Red Oak (log run)
½	Car 1/16′	Red Oak (log run)
½	Car 1/20′	White Oak (log run)
½	Car 1/16′	White Oak (log run)
1	Car 1/28′	Walnut (half round)
25M	1/28′	Poplar Crossbanding
5	Cars 1/8′	Poplar (log run)
2	**Cars 1/8′**	**Poplar (corestock)**

Prices by wire on receipt of your inquiry

HB

Reg U.S. Pat. Off.

FORT WAYNE, IND.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

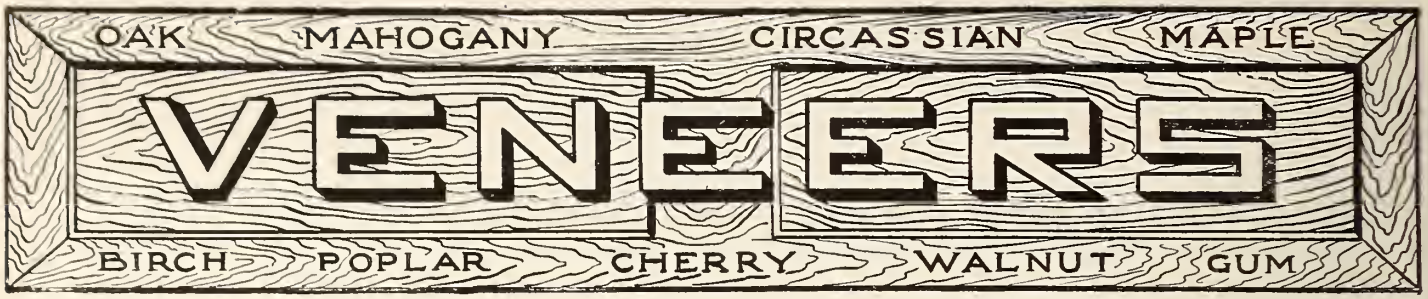
The Standard Veneer Co.
Portland, Maine

Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

May we know your requirements early?

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

VENEER MANUFACTURERS COMPANY
MANUFACTURERS IMPORTERS

QUALITY VENEERS AND PANELS! THE BEST IN ALL KINDS!

ROTARY CUT, SLICED AND SAWN, FIGURED AND PLAIN

DOMESTIC AND IMPORTED STOCK!

We are located on the Chicago Junction Ry. which enables us to receive from and ship to all parts of the world on short notice.

Send us for requisitions for dimension sizes in gum and poplar.

1036 W. 37th. St **Chicago, U. S. A.**

Subscribe for the
Canadian Woodworker
and
Furniture Manufacturer
Only $2.00 per year

100% EXCELLENCE
Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK
Years of Experience Behind Our Products
The Munising Woodenware Co.
MUNISING, MICH.

"Established 1884"

GUELPH PATENT CASK CO. Ltd.
Scotstown, Que.

QUALITY *SERVICE*

Our Veneers and Plywood are choice and we are fully equipped to supply the Canadian Trade.

Rotary cut Textile dried

We specialize in 1/4" and 3/16" three ply Birch Panels

Ontario Representative:
Frank Moss P. O. Box 356, **Toronto**

In our New York Sample-Rooms, which are typical of the Sale Branches. From a snap shot by R.W.W.

Quality Veneers
in

WALNUT BUTTS
MAHOGANY
LONG WALNUT
BURLS · OAK · POP-
LAR & OTHER WOODS

THE WILLIAMSON VENEER CO.

MILLS - BALTIMORE, MD.

Sales-Branches: NEW YORK (709 SIXTH AVENUE) CHICAGO (28 E. JACKSON BOULEVARD) HIGH POINT, N.C., JAMESTOWN, N.Y.

VIEWS OF OUR PLANT No. 11 H.G.W.D.

Pickrel Walnut Veneers

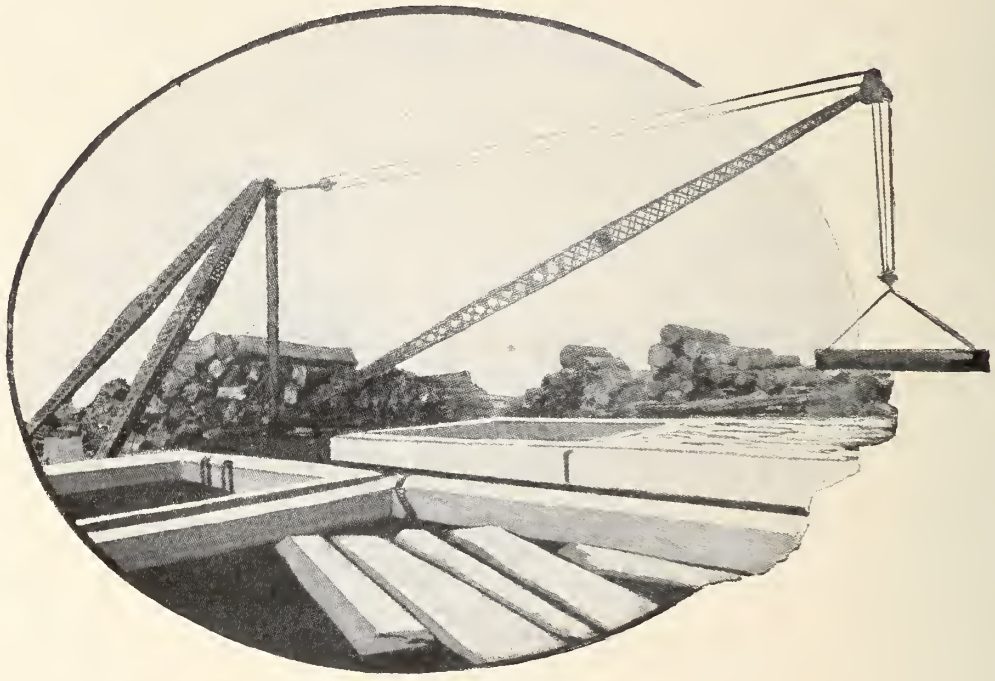
The Accepted Quality Standard of a Superlative Article

Through its remarkable merit and beauty walnut has been honestly and cleanly sold to the public. It has stayed sold, reaching every month new fields of utilization, purely by virtue of its undisputed superiority and the uniformly high-class product offered. Pickrel Walnut Veneers are not only universally accepted as the quality standard in established lines of walnut consumption, but are greatly contributing to walnut history in the many interesting new fields which walnut is gradually dominating. Established walnut buyers know our product and service. To new users of walnut veneers we would like to not only emphasize our impressive selection of veneer logs, our honest, careful and experienced manufacture, and the 6,000,000 to 7,000,000 feet of selected reserve veneers always on hand, but to particularly stress the importance of the experienced and conscientious individual representation through which Pickrel veneers are offered at their respective plants. This genuine personal touch insures the closest possible conformity to individual requirements, meaning less cost in working and a better finished product.

PICKREL VENEER COMPANY

NEW ALBANY, INDIANA

Steaming



THERMOSTATICALLY CONTROLLED STEAMING VATS

These vats, efficiently manned, guarantee uniform
and thorough steaming of the logs used
in the manufacture of our

Superior Veneers

Wood-Mosaic Company

INCORPORATED

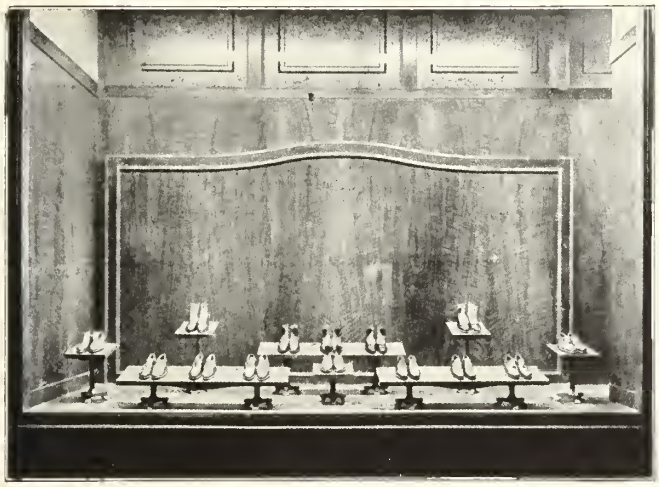
LOUISVILLE, KENTUCKY

Representative
H. ROBERTSON
232 Lyon St. N. W.
Grand Rapids

Representative
GEO. W. STONEMAN & CO.
845 W. Erie Street
Chicago

C. L. WILLEY COMPANY

The **Largest Veneer Plant** *in the* **World**



THE GOODS displayed in the wonderful show windows of the great store of Marshall Field & Co., at Chicago, are "backed up" by

American Walnut Veneer

from the plant of the C. L. Willey Co.

Furthermore, all the Walnut Veneer in the entire Men's Building was supplied by the same company—a circumstance fully in keeping with the well-known high standards of Marshall Field & Company.

The beauty of this woodwork has been remarked by many.

Veneer & Lumber

Walnut
American and Circassian
Mahogany
Quartered Oak
English Oak
Satinwood
Vermilion
Teak
Rosewood
And many other Foreign and Domestic Woods

(1776)

ONE SOURCE of supply for all the Veneers you use makes it practicable for you to place your orders so as to get carload shipments, thereby effecting a saving in freight, and avoiding the risk of damages in transit.

Avail yourself of these advantages—you will find at our plant such a variety of figure, in practically every kind of wood, as will surely meet your requirements.

And you will enjoy our promptness of delivery, as well as our service in general.

Samples gladly sent. Just let us know the general character of the Veneer wanted, and we will at once make careful selection of samples, from flitches on hand, and send them to you.

Anything we can do to assist you in finding any particular figure, will gladly be done. Your needs are of the utmost importance to you—therefore we give them our utmost attention.

C. L. WILLEY COMPANY

2558 South Robey Street

CHICAGO

W. T. MOORE
110 Pearl Street,
Grand Rapids, Mich.

W. B. VAN
Everett Hotel
Jamestown, New York

What the Furniture Store Tells

(Continued from page 82)

to the defective side of the panel and asked: What makes this half of the panel look as though it were pebbled?"

The cause of the trouble was in the veneer itself, or rather the cutting of the veneer. It is difficult to cut veneer with the wrong side so perfect that it will finish and never show signs of ruptured fibers; but it can be done, and is done. One should examine the wrong side of th veneer very carefully before taking the risk of laying it with this side up. In matching veneer it is necessary at times to reverse each alternate sheet in order to produce the desired figure, but only the most perfectly cut stock can safely be used for this purpose. The checks in the panels before us were very small, and it is not likely they were ever seen by the workmen in the factory, but the varnish had checked along the line of the checks in the veneer and magnified them many times.

When stock of this kind stands for some time in the factory before rubbing, the checks will show; and then the usual practice is to revarnish and rub out before it has a chance to check the newly-applied varnish. This does not, however, correct the matter, because the varnish last applied will check as did the first. When buying veneer one should know the purpose for which it is to be used, and never buy stock that must be reversed to produce the figure unless it is absolutely free from ruptured fibers that cannot be removed in the cleaning up.

Crossbanding at Fault

The next defect that attracted my attention was a depression about the size of a dime in the centre of an otherwise beautiful table top. Although small in size, the effect could not have been much worse had the defect been many times larger, for it seemed to have more power to attract attention, it being the first thing about the top that my companion noticed. It was not a defect in the veneer itself, but in the crossbanding below, and which showed through the veneer. It is just possible the crossbanding had contained a deep bruise at the time it was laid, and the workman thought it would fill up with glue and never be seen again when covered with the face veneer. But the glue had shrunk in drying and drawn the face veneer down with it, and there was the defect, showing many times worse than the original when viewed in contrast with the beauty of the surrounding surface.

Crossbanding should be handled as carefully as face veneer in order to avoid injury to the face side. Defects in the face side of crossbanding should be remedied before the face veneer is laid. When crossbanding and face veneer are laid at different times the defects can better be remedied after the former has been laid. If it is a bruise or a hole, it should be filled up with either a plug or glue and sawdust. Do not think to remedy matters by scraping out a shallow bruise unless the whole surface is taken down to the same level. When the hole is filled, give the filling time to dry and shrink before leveling off. Never put in a plug with the end wood to the face, for such a plug will not respond to the action of the glue, nor to atmospheric changes, in harmony with the surrounding surface, and the result will be either a raise or a depression.

Crossbanding that is 1/8-in. or heavier is more liable to have an uneven face than the thin stock. This gives one more reason why heavy crossbanding should be laid in advance of the face veneer, for if both are laid at the one time there is no possibility of having a perfectly level surface when finished. In preparing the surface of such crossbanding for the face veneer care should be taken to see that the surface is taken down at all points alike. If the surface is very uneven, requiring a moderately deep cut, the triple-drum sander is the machine to use. Put fresh, coarse paper on each roll so that the cut can be made clean without much pressure. If much pressure is given the paper may cut deeper into some parts of the wood than in others, and thus defeat the very object which we have in view. If the crossbanding has a fairly even surface the wood-scraping machine is the thing to use. It may be necessary to run the stock through the scraper more than once to produce a perfectly level surface. As soon as the scraper touches at all points, the required surface has been produced. By watching the shaving one can tell whether or not all points have been touched.

What Caused Blotch in Finish

"What is the cause of the blotch in the finish on the panel of that bed?" asked my companion, indicating a bed that formed part of a beautiful mahogany suite. She had noticed the defect like a large grease spot, but was what is known in the finishing room as "sweating;" at least it is frequently called by that name, although sweating is something quite different. The trouble before us was caused by rubbing through one coat of varnish into the coat below—at least that was the immediate cause of the defect, but the primary cause went farther back. In the early days of finishing as we know it today it was the common practice, where two or more coats of varnish were applied, to allow but a short timt for the first coat to dry before applying the second coat, and about double the time for the second coat to dry before applying the third. This method was thought to hasten the final drying in preparation for the rubbing.

The fallacy of this argument has frequently been shown, nevertheless this method is still followed in a few shops, and where the method is followed there is always danger of what is frequently misnamed "sweating," as well as the cause of that very thing. Sweating is caused by a too-rapid hastening of the early stages of the finishing process, sometimes by surfacing before the filler is dry, or following with the second coat of varnish too soon after the first has been applied. But the defect before us was not caused by any of these. It was caused by the second coat of varnish being too dry before the last coat was applied. This prevented a perfect union between the two coats, and when the rubber went through the outer coat in places into the one below, the two coats showed up distinctly, giving the finish a blotchy or smeary appearance.

Drying Each Coat of Varnish

Instead of hastening the early stages of the finishing process, the proper way is to allow each coat to become quite dry before the succeeding coat is applied, until one reaches the point where a perfect union of coats becomes necessary. In the case of three-coated stuff the first coat should be allowed to become perfectly hard before the second is applied. This will take a longer time between these two coats, but the time will be fully saved between the second

TORONTO HARDWOOD LUMBER COMPANY LIMITED

(Formerly Lumber Dept., Toronto Veneer Co. Ltd.)

Head Office:
1100-1104 Queen St. W., TORONTO. Phone Park, 6980
Yard: Atlantic & Hanna Aves. Grand Trunk Ry. Toronto.

Montreal Office:
424 Power Bldg. Phone Main 8725
Saw-mill: Louisville, Ky.

Walnut	White Ash	Birch
Mahogany	Gum	Basswood
Yellow Poplar	Cottonwood	Beech
White Oak	Sycamore	Maple
Red Oak	Cypress	Elm
Chestnut	Yellow Pine	
	Tennessee Red Cedar	

Ample stocks of the above woods yarded in Toronto. Kiln-dried stocks shipped if desired.

Carload shipments made from our Band-mill at Louisville, where our manufacturing and yarding facilities are unexcelled.

If you are not receiving our monthly stock and price lists, please send us your name so that we may place you on our mailing list.

OUR SPECIALTY—INDIANA FORKED-LEAF WHITE OAK.

An unchanging high standard is your assurance of the utmost in Quality and Service when buying

PANELS LIMITED

Southampton - - - - Ontario

TOPS
CASE GOODS
FLUSH VENEER DOORS
3 AND 5 PLY PANELS
3 AND 4 PLY TABLE RIMS
5 PLY RIM BOUND TABLE TOPS

On hand for Immediate Shipment:
Stock Panels in Mahogany, Walnut, Oak, Birch, Etc.,

Sizes	24 x 60	30 x 60
	24 x 72	30 x 72

Selling Agents:

Toronto Veneer Co., Ltd. 1100-1104 Queen St. W. Toronto

and third, and more than regained in the final drying. The second coat will dry much more rapidly if the first coat is perfectly dry; and, what is more, it is not necessary to allow it to become as dry before applying the third coat as when the first coat is only partially dry. When the first coat is only partially dry at the time the second is applied, there is always danger of "crawling," unless a long time is allowed for the two under coats to harden. Then comes the trouble we are trying to explain. The surface of the second coat takes on a hard film—too hard for the solvent in the following coat to make an impression on it, and the result is an imperfect union. With the first coat perfectly hard it is no longer a factor to be reckoned with in the drying of the succeeding coats, so that the second coat may be followed with the third in the same time as though only two coats were being applied and the second coat were the first coat. By this method there is no dividing line between the last two coats, because they have united as one.

There is no danger of allowing the first coat to become too dry before applying the second, as there should never be any necessity for the rubber to go deep enough to reach the first coat. Stock that requires so much rubbing that the first coat of varnish is endangered before a smooth finish is obtained should have the attention of the head of the woodworking department called to it, and greater attention given to the cleaning up of the surface for the finish.

"Veneers," Indianapolis

4121. Box shooks.—A Manchester firm is always open to receive quotations on box shooks.

Handling Veneers in Storage

Serious losses occur in many plants because sufficient attention is not given to the storage of veneers. Often when roaming through a plant one finds the flitches and bundles of veneers piled here and there on the floor in the veneer storage room, being handled time after time, in some cases walked over, with the result that the loss from breakage and spoiled stock is much higher than it should be. In the well-managed plant veneers are all carefully sorted and stored on suitable racks, different woods and different flitches being kept by themselves, each lot being tagged or identified in some other way.

Storing the veneers in racks offers certain advantages. Not only is it possible to accommodate more material in a given space, but it is stored to better advantage as the air has an opportunity to work around the different lots and keep them in fairly good condition. Where the stock is simply thrown on the floor, if the room happens to be damp, there is a danger of mould or mildew forming or the stock being badly stained.

Veneers of different kinds cost good money, and every effort should be made to see that they are handled and stored under conditions which will not only tend to reduce all losses but which will keep the stock in such condition that it can be worked to the best advantage. The writer has been in plants where conditions in the veneer storage room were not only an eyesore but a disgrace, and in other plants where the neat, orderly way in which the stock was kept, showed a full realization of the value of well-kept veneers.

This photograph was taken of our exhibit at the Indianapolis Industrial Exposition held in Indianapolis last fall, which was attended by more than 150,000 people. Our exhibit was pronounced the finest display of Hardwoods and Veneers at the exposition.

WE HAVE THE FOLLOWING VENEERS READY FOR IMMEDIATE SHIPMENT:

1-20" Qt. Sawed White Oak
1-16" Qt. Sawed White Oak
1-8" Plain Sawed Red Oak
1-8" Cherry
1-8" Walnut
1-28" Walnut Sliced

2,000,000 Feet of Indiana Hardwood Lumber

F. M. Bachman Co., Indianapolis, Ind.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

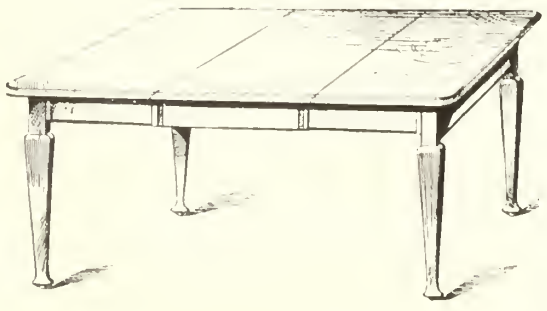
LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

PROMPT delivery in any quantity at very attractive prices. Just let us know your requirements and we shall be glad to forward quotations.

Panels are made in Walnut, Quarter Oak, Birch, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.



HAY & CO., Limited Woodstock, Ont.

The Lumber Market

Domestic Woods

The Canadian market is showing signs of increasing activity in certain lines, while others are fairly quiet. Almost any kind of lumber required for building is in strong demand to-day. This applies particularly to such items as hemlock, the lower grades of pine and other material used in framing a building and also to the hardwoods used for flooring and interior trim. The residential building field continues to forge ahead of the figures set during the last few years. The total value of contracts let for residential buildings during the first four months of 1922 is $24,815.00., as compared with $18,000.000. for the same period last year. $16 000,000. for 1920 and $7,000,000. for 1919. The total volume of contracts awarded, during the first four months of 1922 covering all classes of building, reaches the tidy sum of $62,000,000. This unusnal, but gratifying, expansion and development in the building field is bound to be reflected in the lumber arena and, in fact, will, through time, have a stimulating effect on the furniture and allied industries. The general demand for hardwoods, that is, hardwoods as a whole, is none too brisk, while those catering to the building industry are using a fair volume of hardwoods of different kinds. yet some of the most important hardwood-using industries, such as the furniture industry, are facing a quiet period, and as a result are not in the market. In this field all indications point to a stiffening of values, stocks of Canadian hardwoods in Ontario are becoming badly broken and present prices are considered to be ruinous. One wholesaler recently stated that the producing mills are demanding more for their hardwoods than he is able to get on the open market. The demand for thick birch is not quite so insistent, but there is a steady call for 4/4 stock in 1sts and 2nds, and also for No. 1 common. This latter item is reported to be getting scarce with a tendency toward higher prices. In maple, 6/4, No. 1 common and better seems to be the favorite item. Basswood is fairly quiet with elm showing signs of increasing activity. It would seem as if those who have hardwood stocks for sale, are holding them for firmer prices. Practically all the sawmills in Ontario have started up for the season and the cut is likely to at least equal that of last year.

Imported Woods

Demand for hardwoods is steadily increasing while stocks are becoming more depleted. The tone of the market is strong, and growing stronger daily. New price lists are being circulated by many of the southern producers, carrying substantial advances on numerous items. It is reported that, due to order files being far out of proportion to the available supplies and to the still unfavorable production conditions, some firms are withdrawing their salesmen from the road, and have withdrawn practically all their offerings. Consuming interests in the meanwhile are showing genuine anxiety regarding their future supplies. Industrial activity, as a whole, is expanding and stocks in consumers' hands are in most cases, far from ample to sustain increased operations, and the search for the required hardwoods is in many cases becoming really frantic. The manufacturers of flooring, interior trim and sash and doors, who continue to find their business expanding with the steady development of building construction throughout the country, have particularly large needs to satisfy and are scouring the market for everything suitable to their purpose. Next to the building material interests, the automobile and body manufacturers are probably the most active on the market at this time. They are buying sizable quantities of thick elm, ash and miscellaneous hardwoods, and it appears that their future needs will be large. The furniture trade has shown no great change, altho the tendency seems to be toward a larger volume. Sales of low grade cottonwood, gum and oak are increasing, according to most reports, and prices seem to be substantially above the average of about a month ago. Reports from the northern producing sections state that the market is showing increasing strength and stability, in that manufacturers look for further price advances on a number of items shortly, because of the serious shortage existing in them. These sections also report that the demand for low grades shows improvement, and that several large sales of No. 3 common have been made at prices higher than those previously obtained.

Memphis, Tenn. Our reports from Memphis indicate that there has been an increase in the demand for hardwoods of various kinds, and as a result, the tone of the market is considerably firmer. New quotations now being sent out, show a number of increases over the lists issued during the past few weeks. Production is still low with short stocks, and as a result, some of the lumber manufacturers have recalled their salesmen. It would appear as if consuming interests are showing a greater insight with regard to their future supplies. This applies more particularly to sash and door men and manufacturers of flooring and interior trim. There has not been much change in the attitude of the furniture industry which seems to be resting easy. In this particular field the greatest activity is being shown in gum, oak and cypress.

Louisville, Ky. The increased building activity has had the effect of increasing the activity in this market. Prices have advanced on certain stocks, more particularly red gum and poplar in the heavier sizes. Pine has advanced on this market $4.00 to $5.00 per M. and the prospects are that hardwoods will follow suit. One reason why this is likely to occur is because of the decreased production due to high water in the southern districts.

Evansville, Ind. There has been a slight improvement on the Evansville market. Part of this is due to an increasd demand from furniture factories for veneered stock. Apparently the high water in Western Kentucky is showing signs of subsiding, which means that logging operations in this district may be resumed shortly. This will have the result of increasing the production of the Evansville mills. As Evansville is a furniture-manufacturing centre of no mean importance, it is interesting to note that there is less employment than a month ago, and some of the furniture factories state they are employing 98% of their normal forces.

The planing mill of John H. Crandall, Moncton, N. B. was recently destroyed by fire entailing a loss of between $4,000 and $5,000.

Suggestions of Live Current Items

The usual famous Anderson-Tully service stands behind every foot of the following list of specials which we are pleased to offer the buying trade:

QUARTERED WHITE OAK

4/4 FAS 150,000

Full product of the log in this grade. Stock containing all of the 10" and wider produced, average 7½" for width, 45% to 55% 14' and 16' lengths.

4/4 No. 1 Com. & Selects .....150,000'

Full product of the log in this grade. 45% to 55% 14' and 16' lengths. Stock 8 to 12 months dry.

QUARTERED SYCAMORE

6/4 No. 1 Com. & Bet ..... 75,000'
5/4 No. 1 Com. & Bet. ..... 40,000'

Sycamore is beautifully figured stock, band sawn and equalized, 7 to 8 months dry. 55% to 60% 14' and 16' lengths. All wide in this stock.

LOCUST

4/4 Log Run .....One Car

SOUTHERN SOFT MAPLE

5/4 Log Run .....100,000'
(Worm holes no defects)
10/4 Log Run .....100.000'
(Worm holes no defects)

PLAIN RED OAK

5/4 Common & Select .....60,000'

PLAIN SAP GUM

5/8 FAS .....150,000'

PLAIN SYCAMORE

5/8 No. 2 Com. & Bet.....100,000'
6/4 No. 1 Com. & Bet. ..... 100,000'

Both items running 60% long lengths. Band sawn and equalized and 7 to 8 months dry.

HACKBERRY

5/4 No. 1 Com. & Bet. ..... 150,000'

Band sawn, thoroughly dry, and high grade in every particular.

HICKORY

8/4 No. 2 Com. & Bet. ..... 200,000'
6/4 No. 2 Com. & Bet. ..... 100,000'
10/4 No. 2 Com. & Bet. ..... 20,000'
12/4 No. 2 Com. & Bet. ..... 30,000'

WILLOW

We make a specialty of Willow in 4/4 to 8/4 thickness, and have a stock of this wood. We particularly want to move

4/4 No. 1 Common ..... 200,000'
5/4 FAS. ..... 40,000'
6/4 No. 1 Com. & Bet. ..... 100,000'
8/4 No. 1 Com. & Bet. ..... 50,000'

All of this stock thoroughly dry.

Discriminating buyers will find that it pays to be linked with an organization and service so truly founded on an understanding not only of the manufacture of lumber, but of its proper merchandizing and utilization.

ALL STOCK SIX MONTHS AND BETTER DRY

ANDERSON-TULLY COMPANY

MEMPHIS, TENNESSEE

ATCo (MEMPHIS) SOUTHERN HARDWOOD LUMBER & VENEER

Issue Dicennial Record

The Forest Products Laboratory, Madison, Wisconsin, recently published an attractive volume under the title "The Forest Products Laboratory—a Decennial Record." in commemoration of the Decennial Celebration held at Madison last year. This work covers the various phases of activity as carried on by the Laboratory and shows what has been accomplished in the way of more efficient utilization of forest products and in the elimination of waste. It traces the growth and development of this important institution and outlines how its activities have been enlarged to embrace practically all phases of the wood-manufacturing and wood-using industries. The war work of this institution is covered in detail. It will be remembered that the Forest Products Laboratories rendered signal service in the development of plywood, plywood glues, aeroplane propellers and kiln-drying methods for the use of manufacturers of aeroplanes and aeronautical supplies. Anyone desiring a copy of this interesting and instructive book can secure one from the Forest Products Laboratory upon payment of $1.75.

Bonus System That is Different

A bonus system which ultimately will affect all its factory employes has been inaugurated by a manufacturing concern in Cleveland, Ohio. The bonus is in addition to and entirely independent of hourly wages, and differs materially from the ordinary piece work.

Only good pieces of work that pass rigid inspection qualify the workers to earn a bonus. All jobs will be analyzed and classified according to the skill required of the operator, every job being assigned to one of ten bonus qualifications.

In addition to a job bonus classification a standard table of fatigue and rest allowances, classified according to the job, is adopted—from 10 per cent to 22 per cent allowances are made for fatigue and rest, the most being applied to work which puts the greatest strain on the worker.

When a job has been studied and classified, a bonus chart and instruction card is filled out and given to the worker. The instruction card shows the method by which the work should be done, giving equipment, set up, total time for each part of the operation, total net time, time allowance for fatigue and the standard time for doing the job.

The chart is set on the standard time of the instruction cards for 100 per cent efficiency, but a man begins to earn the bonus when he reaches 60 per cent. of the standard. The bonus chart shows the amount of money which may be earned by increasing the output.

It is an attempt to pay the workers according to their ability.

Two More Glue Suits Decided

In the suits brought against the Wisconsin Chair Co., and the Gould Manufacturing Co., by the Perkins Glue Co., the judge upheld the decree of the Court of Appeals and dismissed both cases. In both these suits the adhesive used was Kane vegetable glue.

VENEERS
and PLYWOOD

"WATERVILLE MAKE" Means Highest Quality.

Correspondence invited

We specialize in ROTARY CUT VENEERS from all native woods—Birch, Maple, Elm, Ash, Beech and Basswood.

Log-run or dimensions as required.

PANELS, 3 and 5 ply, faced with any desired veneer from stock.

Waterville Veneer & Panel Co., Ltd.
Waterville, P. Q., Canada

TURNER-FARBER-LOVE COMPANY

MANUFACTURERS

HARDWOOD LUMBER AND SLACK COOPERAGE

SUCCESSORS TO

DARNELL-LOVE LUMBER CO LELAND, MISS.
RUSSE & BURGESS, INC. MEMPHIS, TENN.
LELAND STAVE & LUMBER CO. LELAND & CHICAGO

MEMPHIS, TENNESSEE
U.S.A.

The following is a list of unsold lumber on our yards, nearly all of which is dry and available for prompt shipment. We solicit your inquiries and orders, for straight or mixed car lots.

QUARTERED RED GUM

20,000	5/8"	FAS
12,000	3/4	"
15,000	4/4	"
30,000	5/4	"
18,000	6/4	"
100,000	8/4	"
50,000	5/8	No. 1 C&S
65,000	3/4	"
45,000	4/4	"
30,000	5/4	"
25,000	6/4	"
95,000	8/4	"

PLAIN RED GUM

10,000	3/8"	FAS
30,000	1/2	"
16,000	5/8	"
15,000	4/4	"
12,000	5/4	"
85,000	3/8	No. 1 C&S
112,000	1/2	"
60,000	5/8	"
60,000	3/4	"
30,000	4/4	"
12,000	5/4	"

PLAIN SAP GUM

30,000	1/2	FAS
50,000	5/8	"
20,000	3/4	"
15,000	4/4	"
18,000	5/4	"
60,000	6/4	"
75,000	5/8	" 13/17
75,000	4/4	" "
60,000	4/4	" 18/21
24,000	4/4	" 22/up
16,000	4/4	" 9/12" Box BDS.
120,000	4/4	" 3/17" " "
29,000	3/8	No. 1 C&S
50,000	1/2	"
100,000	5/8	"
30,000	1/4	"
20,000	1/2	No. 2 Com.
95,000	3/4	"
30,000	4/4	"
60,000	8/4	"

QUARTERED RED GUM
(Sap No Defect)

50,000	5/8	FAS
50,000	3/4	"
16,000	4/4	"
60,000	5/4	"
95,000	6/4	"
60,000	8/4	"
50,000	10/4	"
20,000	5/8	No. 1 C&S
18,000	3/4	"
16,000	4/4	"
35,000	5/4	"
75,000	6/4	"
15,000	10/4	"

ELM

40,000	4/4	12 & Wdr. Cof. Bd.
36,000	4/4	Log Run
30,000	6/4	Log Run
16,000	4/4	No. 1 Com.
34,000	4/4	No. 2 Com.
19,000	6/4	"
24,000	8/4	"
60,000	10/4	"
10,000	12/4	"
17,000	4/4	No. 3 Com.
6,000	8/4	"
11,000	12/4	"

ASH

50,000	1/2	FAS
14,000	4/4	"
15,000	8/4	"
17,000	12/4	"
80,000	1/2	No. 1 C&S
33,080	4/4	"
10,000	5/4	"
10,000	6/4	"
17,000	8/4	"
10,000	10/4	"
30,000	12/4	"
18,000	4/4	No. 2 C&S
2,500	5/4	"
12,000	8/4	"
17,000	12/4	"
20,000	4/4	No. 3 Com.

QUARTERED WHITE OAK

10,000	1/2	FAS
25,000	5/8	"
22,000	3/4	"
20,000	4/4	"
22,000	1/4	No. 1 C&S
80,000	3/8	"
45,000	1/2	"
95,000	5/8	"
125,000	3/4	"
15,000	4/4	"
15,000	4/4	Strips
35,000	3/8	No. 2 Com.
50,000	5/8	"
50,000	3/4	"

PLAIN WHITE OAK

20,000	5/8	FAS
10,000	1/4	No. 1 C&S
105,000	3/8	"
90,000	1/2	"
110,000	5/8	"
60,000	3/4	"
30,000	4/4	"
50,000	1/2	No. 2 Com.
112,000	5/8	"
50,000	3/4	"

PLAIN RED OAK

25,000	3/8	FAS
80,000	1/2	"
25,000	5/8	"
16,000	3/4	"
3,000	1/4	"
15,000	5/4	"
8,500	6/4	"
105,000	3/8	No. 1 C&S
125,000	5/8	"
80,000	1/2	"
120,000	3/4	"
20,000	4/4	"
6,000	5/4	"
4,000	6/4	"
4,000	8/4	"
105,000	3/8	No. 2 Com.
100,000	1/2	"
115,000	5/8	"
110,000	3/4	"
14,000	3/4	Soundy Wormy
125,000	4/4	"

PANTHERBURN CYPRESS

15,000	4/4	FAS
75,000	5/4	" 4 to 12"
12,000	6/4	" "
50,000	10/4	" "
60,000	12/4	" "
60,000	4/4	" 13 to 17"
40,000	5/4	" "
10,000	10/4	" "
35,000	4/4	" 18 up
24,000	5/4	" "
30,000	4/4	Selects
40,000	5/4	"
115,000	6/4	"
13,000	12/4	"
100,000	4/4	Shop
100,000	5/4	"
30,000	6/4	"
3,000	8/4	"
45,000	5/4	No. 1 Com.
125,000	6/4	"
45,000	4/4	No. 2 Com. Resawn
100,000	4/4	No. 2 Com.
20,000	5/4	"
15,000	8/4	"
150,000	4/4	Boxing
11,000	5/4	"
40,000	6/4	"
175,000	4/4	Peeky

MISCELLANEOUS

45,000	1/4	FAS Cottonwood 13 to 17"
11,000	4/4	Log Run Maple
12,000	6/4	Log Run Maple
80,000	6/4	Log Run Hickory
7,500	8/4	Log Run Hickory
30,000	6/4	No. 3 Com.
20,000	4/4	No. 1 C&B Black Gum
20,000	4/4	No. 2 C&B Qtd. Black Gum
12,000	4/4	No. 2 A & B Com. Pop.

CYPRESS SHINGLES

225,000	1"	Best
250,000	5"	"
175,000	6"	"
225,000	4"	Prime
250,000	5"	"
125,000	6"	"
250,000	4"	Economy
250,000	5"	"
125,000	6"	"

We also solicit your inquiries on Hardwoods, Cypress, Cypress Lath and Shingles. We have a good assortment and suggest that you buy now for your Spring requirements. We can ship mixed cars in thicknesses from 3/8 to 12/4"

It is understood that our stocks are constantly changing by reason of manufacture and shipment. We are prepared to surface one or two sides.

Sole Manufacturers PANTHER BURN Cypress

News of the Trade

The Rumfrey Toy Co., Montreal, was recently registered.

The Canadian Refrigeration Co. was recently registered at Toronto.

Carlson Upholstering Co., Provost, Sask., was recently incorporated.

The Eaton, Nelligan Shipbuilding Co., Limited was recently registered in Montreal.

The sash and door plant of Sanerre & Pineau, Rimouski, Que., was damaged by fire recently.

J. H. Lebeus, Limited, Lachine, P. Q., has added a new C. M. C. band resaw to their equipment.

The sash and door plant of Leonidas Dion, Thetford Mines, P. Q., was damaged by fire recently.

Belanger & Belanger, Valleyfield, P. Q. are installing the machinery in their new sash and door factory.

Malcolm & Hill, Limited, Kitchener, Ont., are making a line of small cabinets for radio receiving sets.

S. Lambert, Welland, Ont., recently added a new 48-inch C. M. C. band saw to his woodworking plant.

The planing mill of James Hill, Ottawa, was recently damaged slightly by fire. Loss is covered by insurance.

The Gibbard Furniture Co., Limited, Napanee, Ont., are having plans prepared for a large addition to their plant.

Harris Record Phono Co., 200 Papineau Ave., Montreal, are making alterations to their factory at a cost of $5,000.

The Sylvester Mfg. Co., Lindsay, Ont., manufacturers of gas engines, etc., recently installed a C. M. C. No. 619 variety saw.

The 15,000-gallon water tank of the Beach Furniture, Limited, Cornwall, Ont., collapsed recently killing D. Clanette and injuring J. Crawford.

The general offices of the National Association of Upholstered Furniture Manufacturers are now to be found at 915 South Michigan Ave., Chicago, Ill.

Fire recently destroyed the new mill of the Kensington Sash & Door Factory, Kensington, P. E. I. Loss $6,000. The mill had been running only one day.

The G. W. Murray Co., Limited, Winnipeg, Man. have received the millwork contract for the new building erected by the Oddfellows Grand Lodge of Manitoba.

The Prestolock Co. of Canada, Limited, Wallaceburg, Ont., president E. E. Thais, contemplate erecting a factory to manufacture radio equipment and automobile locks.

The Elliott Woodworking Machinery Co., Limited, Belleville, Ont., manufacturers of combination woodworking machines, are placing a line of electric washing machines on the market.

Matthew Stanley, who had a wide reputation as a designer of carriages and founder of the Stanley Carriage Works, Perth, Ont. died recently at his home in Toronto in his 70th year.

F. A. Linton, for many years superintendent of the veneer and panel-making plant of Hay & Co., Limited, Woodstock, Ont. has taken charge of the plant of Panels, Limited, Southampton, Ont.

Among the teams entered in the Ottawa Manufacturers' Baseball League are those of several woodworkers, viz., James Davidson's Sons; J. R. Booth, Limited, and McAuliffe-Davis Lumber Co.

The B. & N. Planing Mill, Milverton, Ont., have been awarded the contract for a new school to be erected at Teeswater, Ont. The Teeswater school board want prices on seating and furniture.

The contract for the new factory to be erected by the Chesnut Canoe Co., Ltd., Fredericton, N. B., to replace their plant destroyed by fire last winter, was awarded recently to Thomas S. Miles, of Devon, N. B.

The Alberta Motor Boat Co., Edmonton, Alta., have about completed an order for 50 canoes, which are to be shipped to various trading posts of the Lamson-Hubbard Co. from the Athabaska to the Arctic Circle.

Milner Toy Co., Milner, B. C., are making some additions and improvements to their plant. They plan on enlarging the scope of their business and also plan on entering into the manufacture of furniture on a small scale.

The Superior Furniture Co., Limited, Havelock, Ont., was recently organized to manufacture and deal in furniture. The future plans of this company depend largely upon the support they receive from the citizens of Havelock.

James B. Hall, Vancouver, B. C., president of the Hall Machines Works, manufacturers of logging and box making machinery died recently in his 69th year. The deceased moved from Toronto to Vancouver twelve years ago.

General Equipment Company of Canada, Ltd., Montreal, were recently granted a federal charter to make and sell motor trucks, wagons and other wooden vehicles. Capital $50,000. F. P. Brais, of Montreal is one of the incorporators.

G. & J. Esplin, Limited, Montreal, have been granted a federal charter to manufacture and deal in boxes, crates and other wooden containers. Capital $400,000. C. Sinclair and R. E. Allan, both of Montreal are two of the incorporators.

The Ontario Handle Mfg. Co. recently took over the plant of the Canada Handle Co. at Weston, Ont. A few changes and additions are being made and the following equipment is being installed,—band saw, lathe and dowel machine.

The Ruddy Mfg. Co., Limited, Brantford, Ont., was recently organized to take over the business of Ham Bros. Co., Limited. A complete line of kitchen cabinets, refrigerators, beekeepers' supplies and bed springs is to be manufactured.

The manufacturers of Ottawa are forming a baseball league and several woodworking teams have entered, among the firms represented on the diamond being James Davidson's Sons; J. R. Booth, Limited and McAuliffe-Davis Lumber Co.

Dominion Show-Case & Fixture Co., Limited, Winnipeg, have been incorporated to manufacture and deal in show cases, and office furniture. Capital $100,000. Two of the incorporators are H. Ormond and H. E. Swift, both of Winnipeg.

The M. S. C. Radiophone Corporation has been organized at St. Thomas, Ont., to manufacture radiophone outfits. For the present temporary premises have been leased and if the demand warrants it, a factory will be erected at a later date.

Jewett Radio & Phonographs, Limited, have been authorized by supplementary letters patent to change their

Look for the brand—It's on every board

THE KRAETZER-CURED LUMBER CO.

Your Protection—Our Guarantee

Kraetzer Curing—What It Is

Kraetzer Curing is simply the modern and more efficient application of the treatment of wood relied upon by the artisans of the earlier periods in the construction of their master pieces of cabinet work. Even, now, after the elapse of centuries, we still frequently encounter such pieces in a perfect state of perservation.

This treatment is even more beneficial to Gumwood than to the woods employed in those earlier times. Kraetzer Curing immediately eliminates the sap and gelatinous substance in the wood. It also completely does away with fermentation and the resulting strain and decomposition, which by some is considered a necessary and deterring evil.

Likewise, Kraetzer Curing makes the sap portion of the wood more dependable than the Heart or Red Wood. It can then be used for practically all purposes with equal or greater satisfaction than Red (or Heart) Gum, Birch, Maple or other woods. It is available at materially lower prices.

Send for the Kraetzer-Cured Booklet, and write or wire for quotations.

The Kraetzer-Cured Lumber Co

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

Our Quartered and Plain Red and White Oak, Ask, Hickory, Red Gum and Tupelo is as fine as the highest quality of virgin timber and thorough knowledge of production can produce.

THERE IS NONE BETTER

name from Jewett Phonograph Co., of Canada, Ltd., to the above. Their capital has been increased from $950,000 to $1,000,000.

The Columbia Gramophone Co., Toronto, are contemplating operating their large phonograph factory on Dufferin St. on a fairly comprehensive scale. When these plans are completed, employment will be given to a large number of hands.

The Starr Phonograph Co. of Canada, Limited, London, Ont., recently suffered a loss by fire when the building in which their assembling plant was located was badly damaged. The loss to the Starr Company is in the neighborhood of $15,000.

The Hespeler Furniture Co., Limited, Hespeler, Ont., are adding two more Sidman units to their battery of dry kilns. This is their third order for Sidman kilns and like their last addition the buildings will be of the Sidman concrete type.

Frames & Fancies, Limited, Montreal, have been incorporated to manufacture and deal in picture frames, mouldings, toys and other wooden articles. Capital $20,000. B. H. Clark and J. Wareing, both of Montreal are two of the incorporators.

Hespeler Novelty Mfg. Co., Hespeler, Ont., are negotiating for a plant at Tara, Ont. If these negotiations are successful, equipment will be installed for manufacturing sleighs, hockey sticks, coaster wagons and wood novelties of various kinds.

C. Lloyd & Sons, Wingham, Ont., have been granted a provincial charter with capital of $80,000 to manufacture and deal in sash and dooors and wood products of all kinds. A. E. Lloyd and R. H. Lloyd, both of Wingham are two of the incorporators.

The new box factory erected for D. R. McKay at Laidlaw, B. C., near the site of the old mill, burned last fall, commenced operations this week. It has a capacity of 5,000 boxes per day and is equipped with modern veneering and wiring machinery.

The Canadian Vickers, Limited, Montreal, shipbuilders, have taken over the Canadian agency to manufacture sea sleds under license from the Sea Sled Company. The latter company is purely Canadian and holds the basic patents rights for Canada and United States.

A Henderson, of Cheltenham, Ont., contemplates establishing a new planing mill and woodworking factory at Orangeville, Ont. Mr. Henderson had a planing mill at Cheltenham but it was destroyed by fire some few weeks ago and he has decided to try a new location.

The planing mill and furniture factory of McCall & Co., St. Williams, Ont., was recently destroyed by fire entailing a loss of $75,000 with a small portion covered by insurance. The dry kiln, two large lumber sheds and a quantity of pine and hardwoods was also consumed by the flames.

W. R. Hughes Company of Canada, Limited, Toronto, have been granted a federal charter to manufacture and market paints, oils, enamels, lacquers and other chemical preparations. Capital $50,000. E. G. Long and R. O. Daly, solicitors, both of Toronto, are two of the incorporators.

A suggestion has been made to the sity council at Brandon, Man., by magistrate A. C. Fraser, that the city purchase a house moving equipment and move 150 residences, at present situated in low lying districts subject to flood conditions, to higher sites in the city which are available.

Hillingsworth & Whitney, Limited, Halifax, N. S. have been granted a federal charter to manufacture and market barrels, tubs, boxes, veneers and all kinds of cooperage stock. Capital $4,000,000. Two of the incorporators are S. D. Jenks and W. C. MacDonald, solicitors, both of Halifax.

The interior woodwork of the new Royal Bank, Walkerville, Ont., which was recently opened to the public was installed by the Canadian Office and Schools Furniture Co., Preston, Ont. According to a statement made by one of the company officials they have the contract for interior fittings covering all Royal Banks in Ontario.

The Millwork Cost Bureau formerly located at 11 South La Salle St., Chicago, has removed its headquarters to more commodious and convenient offices at 605 North Michigan Avenue. The expanded service and increased membership of the bureau made it necessary to obtain more office space according to the advice of secretary W. P. Flint.

The White Sewing Machine Co., Limited, Guelph, Ont., have completed plans to engage in the manufacture of school furniture. This will be in addition to their line of sewing machines. It is expected that the staff will be increased from 60 to 200 men within the next month or two and that by the end of the year they will be employing 500 hands.

The Forests Products Engineering Co., Manhattan Bldg., Chicago are installing their basic time standards, earned hours wage incentive plan and improved methods of operation, in the plant of the Knechtel Furniture Co, Limited, Hanover, Ont. The McLagan Furniture Co., Limited and the Stratford Chair Co., Limited both of Stratford, Ont., are using these methods with gratifying results.

The hockey team of James Davidson's Sons, Ottawa, Ont., won the championship of the Manufacturers' League during the season just closed. This team made a very enviable record, losing only two out of the thirty games played. This success was in no small measure due to the hearty cooperation and assistance rendered by Messrs. Grant and Keith Davidson, sons of the founder of this well-known organization.

Alexander Brown, Winnipeg, of the firm of Alexander & Brown recently passed away in his 81st year. Deceased was a former citizen of Galt, Ont. and as a young man went West in 1872 with Thomas Rutherford and founded the first planing mill and sash and door plant in Manitoba. The firm which still bears the names of the pioneers will be carried on by the sons of the two original founders.

The United States authorities are taking action under the dumping clause of the Emergency Tariff Act to prevent Canadian manufacturers of veneered chair seats shipping into U. S. markets at a price which cannot be met by American chair seat manufacturers. Under this act the duty will cover the difference between the price of the Canadian article and that produced by U. S. manufacturers where the price of the former is lower than the prices prevailing in the states.

J. J. Neander has secured suitable display space at 364 St. Catherine St., East, Montreal, and is showing a representative line of the products of the following firms:— Snyder's Limited, Waterloo, Ont., Canadian Rattan Chair Co., Victoriaville, P. Q., Sidway Merchantile Co., Toronto, and the Middlesex Furniture Co., Strathroy, Ont. This will enable these firms to handle Montreal and eastern trade to good advantage. The displays are being made on two floors of a modern fireproof building, giving about 10,000 square feet of floor space. Mr. Neander is well known to Montreal and eastern firms and his experience and connection should go far to making this new venture an unqualified success.

The Sidman Lumber Curing Process

IN

Remodeled or new, Wood, Brick or **Concrete** Buildings.

Fillers and glazes to preserve the building.

The TAG-ROESCH **Automatic** Time-Temperature and **Humidity Controller.**

Three-ply and Du-o-fold Army Duck Curtains, and Hussey Door Carrier Doors.

Automatic Heating, Ventilating and Humidity Systems for Varnish Rooms.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Sidmans AUTOMATIC **Suction System** for returning ALL Condensation DIRECT to the Boiler.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-Down Draught Vent Heads for all purposes.

Cleanable Screen Panel and Window Ventilators.

Roller Bearing (Ott) **Channel Iron** Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and The Sidman Special Hygrometers.

For Description and prices, write

The

Sidmans of Canada

Heating and Ventilating Engineers and Lumber Curing Specialists

LONDON ONTARIO

"A Birch Column is a thing of beauty when made up of Beautiful Birch

as below:

4	cars	4/4"	No. 1 Com.	& Btr.
1	"	5/4"	"	"
2	"	6/4"	"	"
2	"	8/4"	"	"
1	"	10/4"	"	"
2	"	12/4"	"	"
1	"	16/4"	"	"

Product from best Birch Section in Ontario.

Well Seasoned."

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 203 McGill Bldg.

Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

SITUATION WANTED

SUPERINTENDENT in Office and Store Fitting Factory, with Western and Eastern experience, wishes to change his locality. Good draughtsman and estimator. Apply Box 133, Canadian Woodworker, Toronto. 5

Woodworking Plant

For Sale or To Rent

Manufacturers in good lake town north of Toronto, making products of wood and iron, are discontinuing the wood lines and their woodworking shop with all or part of the machinery and equipment is for sale at a low rate on the dollar, or for rent at a low rental for a year or two, with option of purchase. Building is a separate unit, modern concrete mill construction, 50 feet by 100 ft. two stories, complete with machinery, 200 h.p. steam plant, belting, shafting, shaving exhaust system, dry kilns, elevators, plumbing electric wiring, two railway sidings, large yard. etc., ready to step into for immediate operation. Hydro-Electic power will be available shortly. Box 129 Canadian Woodworker, Toronto, Ont. 5

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Band Resaw, Connell & Dengler, 54 and 60".
Band Rip Saw, Yates No. 281
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 44 in. heavy type.
Dowel Machine, Hayes
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.
Jointer, Falls Machine Co., undercut 24 in.,
Jointers, 12", 16" and 24"
Jointer, Diehl Continuuous Feed
Lathe, Back Knife Clement 40 in.
Moulder, Hermance 8 and 10 in., 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 4" and 10", 4 side
Matcher, American No. 229 fast feed hardwood flooring.
Planers, all sizes, single and double
Sander, endless bed 48 in., H. B. Smith.
Sander, Moore Machine Co., belt.
Sanders, Columbia 42", 48" and 60"
Saw, mitre, double end Maddox.

Woodworking Machinery Company of Buffalo, 54 Mechanic St., Buffalo, N.Y. 1 T.f.

FOREMAN WANTED

Foreman capable of maintaining production in plant making broom handles curtain poles and dowels. Good opening for right man. Must be able to plan the work and keep machines operating. Apply Box 134, Canadian Woodworker, Toronto. 5

WANTED

Position of responsibility wanted by man thoroughly familiar with all details of retail lumber, sash and door, and millwork business. First class testimonials covering long service. Estimator, Sales Manager, etc. Age 38 accurate, reliable and energetic. Good personality. At present employed but desire early change. Confidential. Reply to Box 135 Canadian Woodworker, Toronto. 5

USED MACHINERY

For Quick Sale

1—30" Double Surfacer.
1—26" Double Surfacer.
1—24" Double Surfacer.

Above machines equipped with two-knife square cylinders, sectional rolls, flexible chip breakers, countershafts.

Special price for quick sale.

Colladay Machine Works, Manufacturers of Woodworking Machinery, 626 Race St., Philadelphia, Pa. T.f.

FOR SALE

Planer and Matcher, 24", Double Surface
Box Board Matcher, Mereen-Johnson.
Double Surfacer, 30", C.M.C. No. 212.
Whitney 30" Surfacer.
12" Buzz Planer.
Moulder, 12" heavy pattern.
Moulder 8" Four side.
Tenoner, Cowan 224.
Shaper, Preston, ball bearing.
Shaper, Yates No. 201, double spindle.
Chain Mortiser.
Sash Relisher and Mortiser.
Borer, nine spindle, vertical, Fay-Egan.
Lathe for pattern making, Stevens, 20" x 36" x 11" with gap screw feed double end.
Band Saw, 34" wheels.
Power Feed Rip Saw.
Cut Off Saw, roller table.
Swing Cut Off Saw.
42" Three Drum Sander.
Arm Sander.
Door Clamp.

COWAN & CO., OF GALT LTD.
Galt, Ontario, Canada.

Building in United States

For the first time since 1916, enough new dwellings will be built in the U. S. during the current year to more than care for the increase in demand, according to reports received from over the country by the civic development department of the Chamber of Commerce of the United States. In other words, the prospects are, according to these reports, that the accumulated shortage of dwellings will be somewhat cut down this year.

San Antonio Plans Auditorium

Plans are being drawn for a municipal auditorium by San Antonio, Tex., to be erected in Madison Square. These plans will call for a steel and concrete structure with a seating capacity of about 6,000; the sum of $500,000 is available for the purpose. The planning is being done by Ralph H. Cameron, architect, under the general supervision of the city engineer, D. D. Harrigan, who will also have charge of construction. It is anticipated that the work will start about July.

Big Highway Program Under Way in Texas

Texas has over 2,000 miles on state highways under construction according to the reports received by the U. S. Bureau of Public Roads. This includes 146 miles of concrete and brick pavements, 425 miles of bituminous pavements, 1,190 miles of gravel and macadam roads and the remainder sand-clay, shell and earth roads. This large program is estimated to cost about $28,700,000 of which amount $13,300,000 is to be paid by the state and federal governments, leaving about $15,400,000 to be paid by the counties and road districts.

New work to be undertaken this year will amount to about 1,350 miles estimated to cost $17,265,000. This work will be financed 25 per cent by the state and 25 per cent by the federal government, and 50 per cent by counties and road districts. All federal-aid funds apportioned to Texas have been definitely allotted to projects, according to J. D. Faultleroy, state highway engineer.

Last year 1,078.5 miles of state roads were completed at a cost of $10,637,821.47 but this year's work is expected to exceed these amounts by at least 50 per cent.

Thetford Mines, Que.

Fire destroyed mill and 2 residences owned by Leon Dion, and residence o Elz. Turcotte. Loss is estimated a $60,000.

QUALITY *SERVICE*

In Canadian Hardwoods

K—ind you want
I—mpressive quality
N—o better manufactured
N—o kick
O—n grades
N—ow is the time to order a sample car

The Kinnon Lumber Co., Limited

454 King Street W. — — Toronto

NARROW BAND SAWS AND MACHINES FOR THEIR CARE

Our narrow band saws are made of the best Swedish steel and sharpened on the "Grip Feed" Filing Machine the latter of the most advanced design and construction. We specialize in these two items alone, with many years' experience back of us as our qualification to furnish as good a narrow band saw as there is on the market, together with the latest development in a saw-filing machine for the care of band saws.

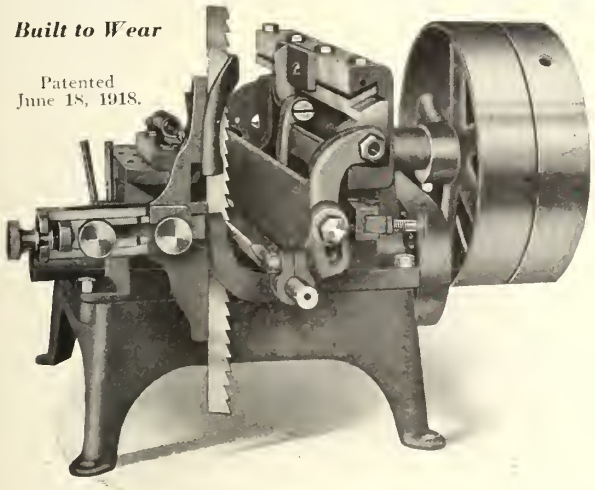
Send us your next order for narrow bands, also ask for particulars of the "Grip Feed" Filing Machine.

American Saw Filing Machine Co.

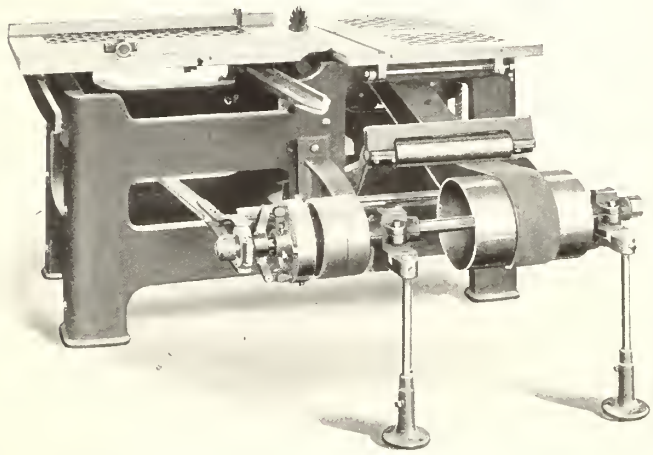
36 Washington St., N. Boston 14, Mass.

Built to Wear

Patented
June 18, 1918.



BEVEL AND MITRE SAW



WOOD-WORKING MACHINES.

No. 19 Small Saw Tenoner.
No. 20 Large Saw Tenoner.
No. 21 Regular Bevel and Mitre Saw.
No. 22 Large Bevel and Mitre Saw.
No. 23 8½-in. Irregular Dresser
No. 24 6-in. Irregular Dresser Stock Clamps.

METAL MACHINES.

Large Automatic Power Hammers (For body panels and all other metal work.)
Small Automatic Power Hammers (For body panels and all other metal work.)
Metal Trimming Cutters.
Rotary Cutters.
Metal Rollers or Formers.
Power Beaders. Foot Presses

No. 21 Bevel and Mitre Saw

Pettingell Bevel Saw finely suited to work on hard and soft wood for use in automobile, carriage, furniture, sash, door and all wood working factories.

Write for catalogue

PETTINGELL MACHINE COMPANY

AMESBURY - MASS.

The Peter Hay Knife Co., Ltd.

Manufacture the Best

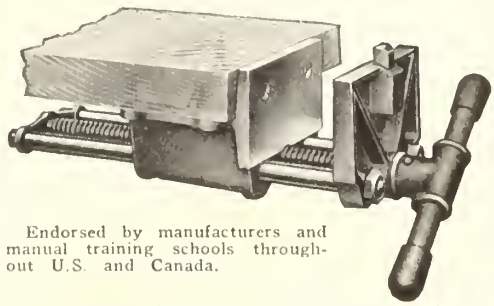
PLANER KNIVES and CUTTERS

OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited

GALT, ONTARIO

Quick as a Cat - A Hold like a Bull Dog



Endorsed by manufacturers and manual training schools throughout U.S. and Canada.

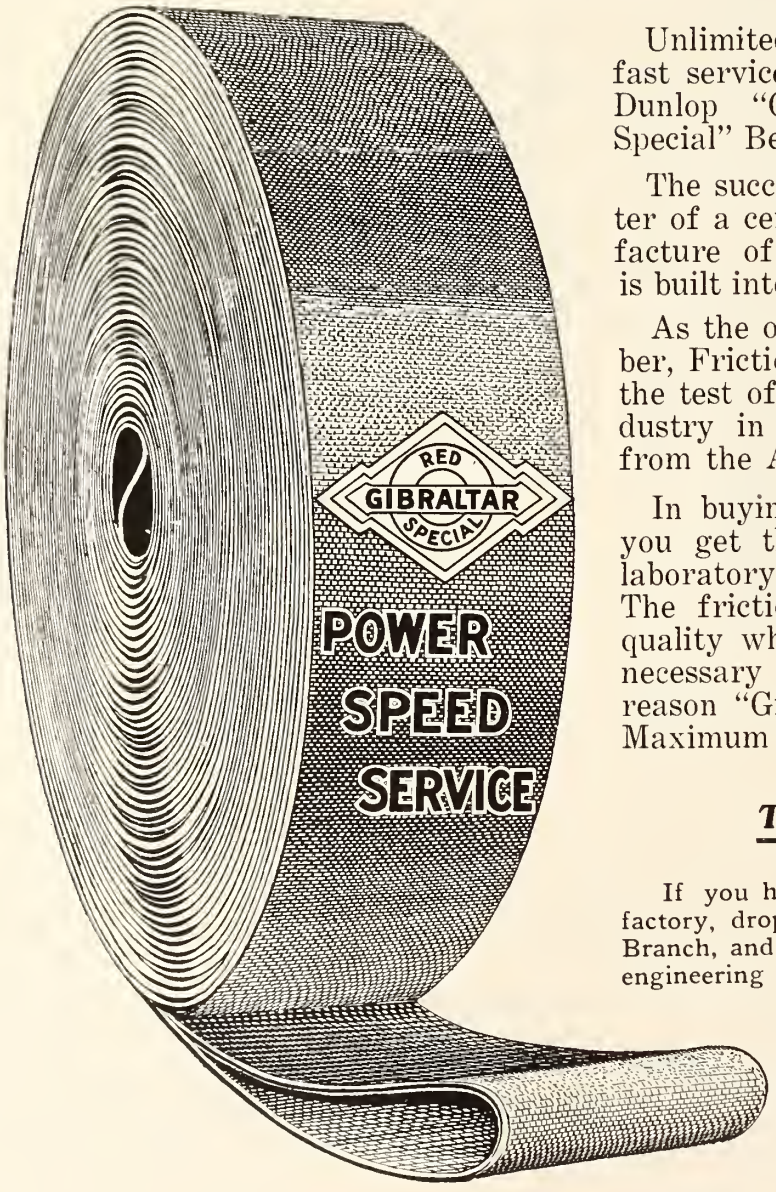
No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

No. 430 Vise—Two Sizes with or without stop
UNEQUALLED FOR STRENGTH AND DURABILITY
Our Complete Catalogue on Request
RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.

Dunlop Belting

—FOR—

Maximum Power, Speed and Service in the Woodworking Plant



Unlimited capacity for hard fast service is the feature of Dunlop "Gibraltar Red-Special" Belting.

The success of over a quarter of a century in the manufacture of Rubber Products is built into Gibraltar.

As the original Made-In-Canada Red Rubber, Frictioned Surface Belting, it has stood the test of time in turning the wheels of industry in a multitude of belt-using plants from the Atlantic to the Pacific.

In buying "Gibraltar RedSpecial" Belting you get the advantage of years of careful laboratory work on our part with this result: The friction is of that "just-right" elastic quality which allows for the give and take necessary in rounding the pulleys; hence the reason "Gibraltar RedSpecial" is known for Maximum Power, Speed and Service.

The Dunlop Guarantee

If you have a difficult drive anywhere in your factory, drop a line to our Head Office, or nearest Branch, and we will send a man experienced in belt engineering to consider your requirements. If it is an instance where "Gibraltar" Belting may be suitably employed we will recommend its use; and we will stand behind our recommendation with the fullest guarantee ever issued by a firm producing rubber products.

Dunlop Tire & Rubber Goods Co., Limited

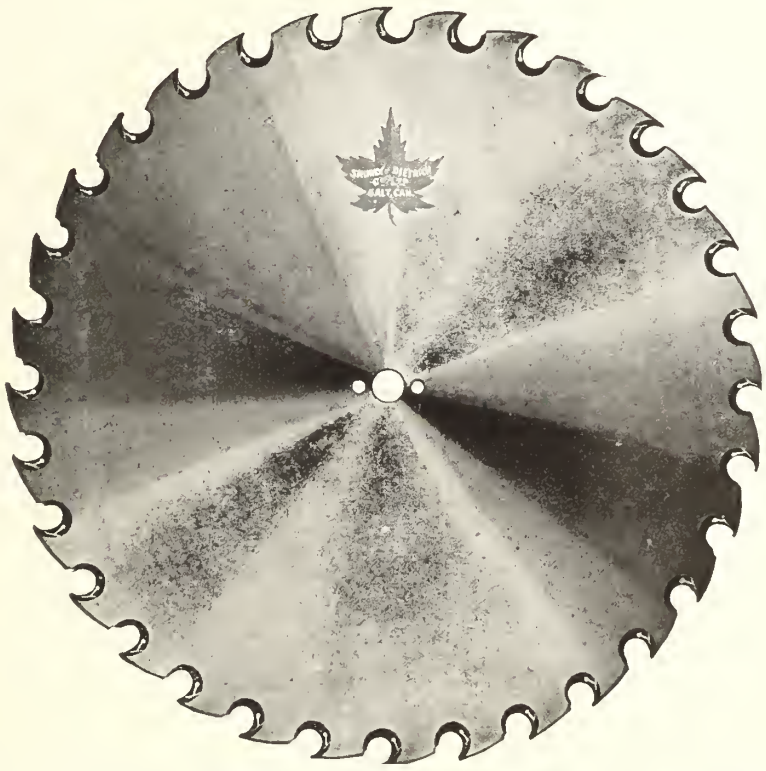
Head Office and Factories: TORONTO

Branches in the Leading Cities

Keener Cutting—Longer Wearing

Maple Leaf saws are perfect in construction and in performance.

If you are anxious to reduce your cutting costs to rock bottom, standardize on Maple Leaf Saws --the complete line include Bands, all kinds of special saws for special work, cross-cut saws, gang saws, dado heads, etc.

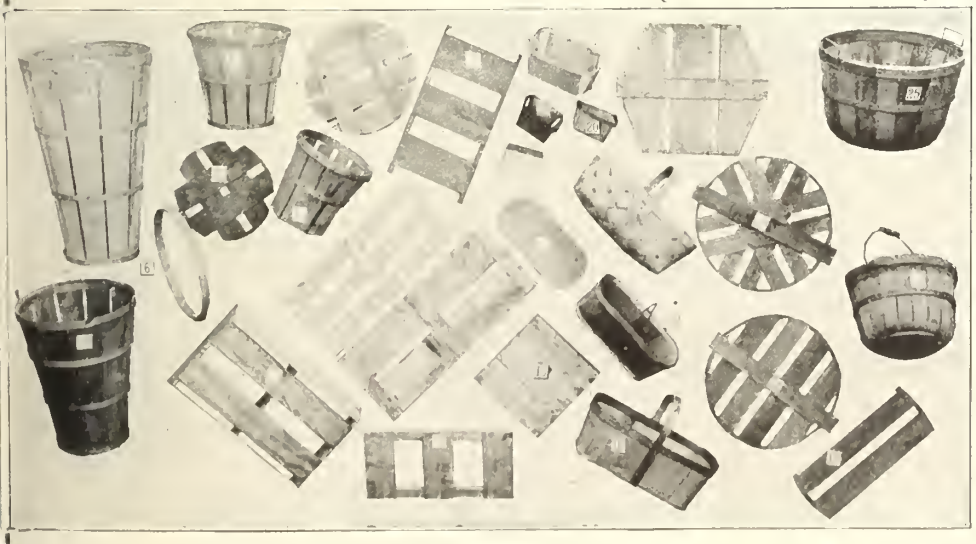


Shurly - Dietrich
Limited
Galt - Canada

Store and repair branches at Vancouver.

"The largest all-Canadian saw manufacturers."

THIS IS THE NAME



of the Machinery for the Rapid Production of

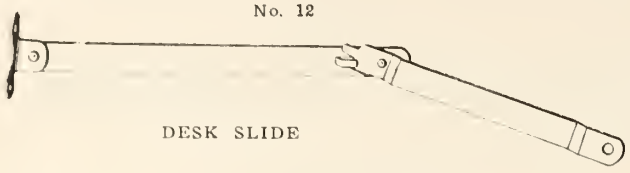
Veneer—Crates—
Baskets—Fruit Packages.

"STJOE"

Get the name fixed in your mind.

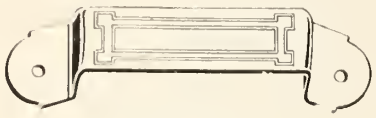
ST. JOSEPH IRON WORKS, St. Joseph, Michigan

No. 12



DESK SLIDE

No. 21



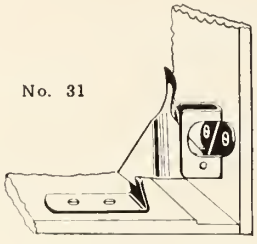
DRAWER PULL

WRITE FOR CATALOGUE

No. 3

DESK TOP FASTENER

No. 31



ELBOW CATCH

Furniture Trimmings and Special Hardware

We Also solicit your enquiry for Special Stampings

Larsen & Shaw, Limited
Walkerton, Ontario

CARVED MOULDINGS, CARVINGS, CARVED LEGS

D-586 (Reduced One-Half) made right and left

No. D-426 (Reduced One-Half)

"KLISE' mouldings are carved, not pressed. Made in several hundred classic, period designs, in various sizes and shapes. Catalogue of legs and samples of mouldings sent on request. Send us your designs or samples of carvings for quotation.

KLISE MANUFACTURING COMPANY
Grand Rapids, Michigan

M 97

M 88

M 77

M 91

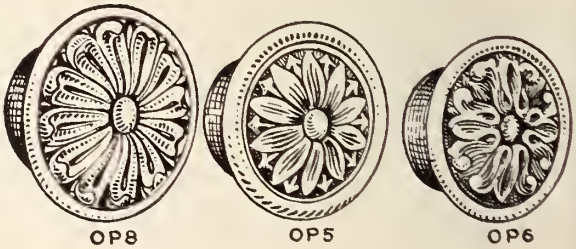
M 72

M 73

MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.



OP8 OP5 OP6

Waddell Manufacturing Company

Coldbrook and Taylor, N. W. **Grand Rapids, Mich.**

——Motors——

RELIABILITY - KNOWLEDGE - PRICE

Motors—60 Cycle

1—3 H.P. Packard, 3 phase, 220 or 550 volts.
6—1/6 H.P., single phase new.
1—5 H.P. Can. Gen. Electric.
1—7½ H.P. Lincoln, and one 7½ H.P. Fairbanks.
1—10 H.P. Gen. Elec. and Lincoln.
1—20 H.P. General Electric.
1—30 H.P. newly rewound by Swedish General Electric.
4—25 H.P. General Electric.
1—50 H.P. General Electric.
1—75 H.P. General Electric.
1—100 H.P. Westinghouse and General Electric.
Above 5 H.P. motors equipped with regular starters.

Motors—25 Cycle

1—5 H.P. Crocker-Wheeler, 1500 r.p.m., 220 volts.
1—2 H.P. Langdon Davies, 1500 r.p.m., 500 volts. r.p.m.
1—40 H.P. Westinghouse, 720
1—15 H.P. British Gen. Elec.
Other various sizes and new Westinghouse stock all sizes.

Direct Current Motors and Generators
125-250 Volts

1 K.W.
2 K.W. | Westinghouse
3 K.W. | Can. General Elec.
5 K.W. | Lincoln.
10 K.W.

Complete with rheostats and pulleys.

60 Cycle, 3 Phase Generators

60 Cycle, 3 Phase Generators
30 K.W.
50 K.W. 1200 r.p.m. General Elec. and Westinghouse.
75 K.W. Westinghouse.
100 K.W. General Elec., 2300 volts, 900 r.p.m.
300 K.W. Westinghouse, 200 r.p.m.
600 K.W. Electrical Machinery 225 r.p.m.
All. complete with exciters and rheostats.

2—175 H.P., 3 cylinder gas, gasoline or crude oil Westinghouse Vertical Engines —250 r.p.m.

Industrial Engineering Company of Canada Ltd.

CONSULTING ENGINEERS - ELECTRICAL EQUIPMENT
R. G. LEE, General Manager
Carlaw Building, Toronto - Royal Bank Building Windsor, Ont.

"The Phillips Line"

Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

Atlas Mfg. Co. of Orlando
Orlando, Fla., U. S. A.

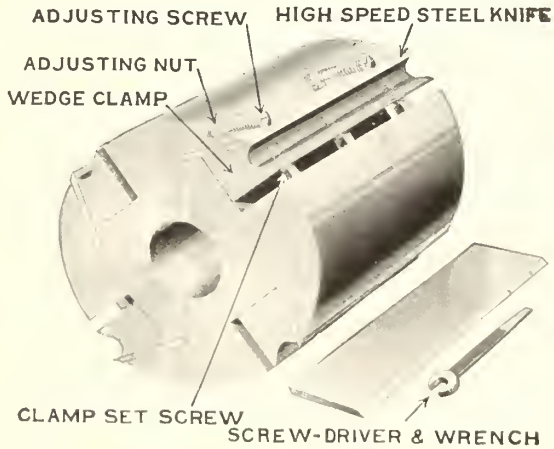
CLAMP NAILS DO IT

The Radio and Phonograph Cabinet Maker

Internationally known and universally adopted by the leading manufacturers of Radio and Phonograph Cabinets, as the most practical and economical method of mitered joinery.

Samples and circulars on request.

CLAMP NAIL COMPANY
4532 Palmer St. CHICAGO, U.S.A.



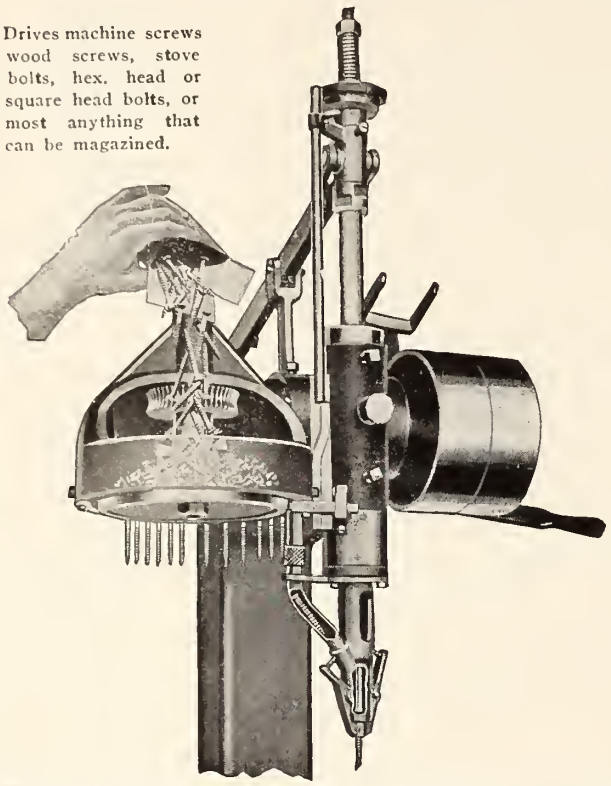
The PORTER "C" Slip-on-Head for Shapers, Jointers and Moulders will cut straight or cross grain without tearing. Irregular shaped knives can be used as well.

There are over 3,000 of these Heads in daily use.
Write for circular and quotation.

C. O. Porter Machinery Co.
GRAND RAPIDS, MICHIGAN, U.S.A.

The Demand is for Lower Prices!

Drives machine screws wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.



Reynolds Automatic Screw Driving Machinery will help you meet the demand

Everywhere the manufacturer is faced with the problem of price reduction. How can he find the solution?

By cutting out every waste—of time, labor materials, etc.

Many manufacturers have installed Reynolds Screw Driving Machinery for this reason. It accomplishes the work-better in one-third of the time.

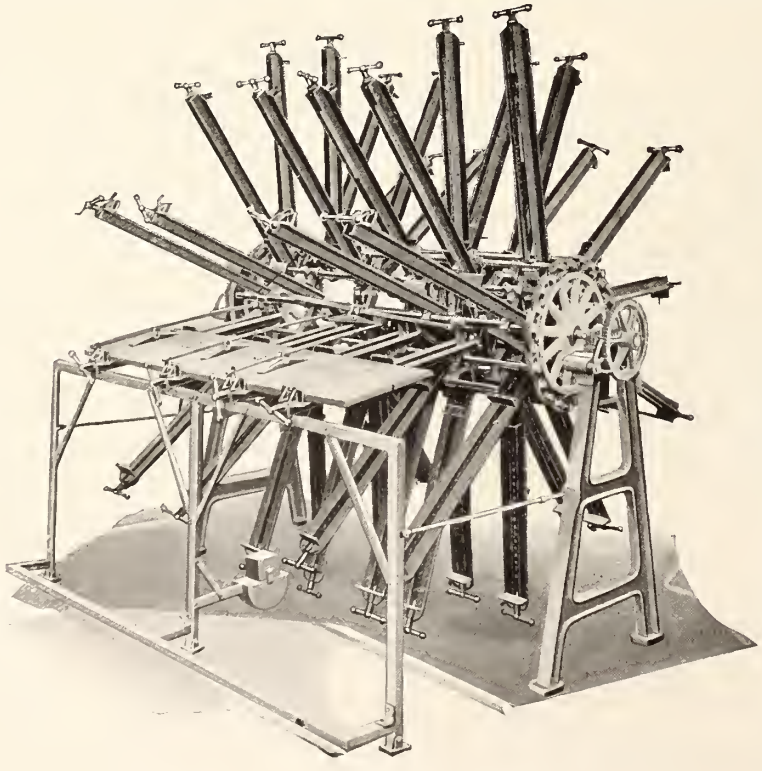
Consequently they are able to meet the demand for lower prices and hasten the return to normal buying.

Are you interested? Then write us to-day for the full facts.

Send us dimensions over all of your work and gauge and length of screws driven so that we can determine the proper size and type machine to meet your requirements.

The Reynolds Machine Co.
Department C.
Massillon, Ohio, U.S.A.

Speed + Perfect Joints = Low Costs



REGIS'D. PAT. OFF
The Taylor
TRADE MARK

CLAMP CARRIER
for
Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.

HYDRAULIC VENEER PRESSES
AND
LUMBER ELEVATORS

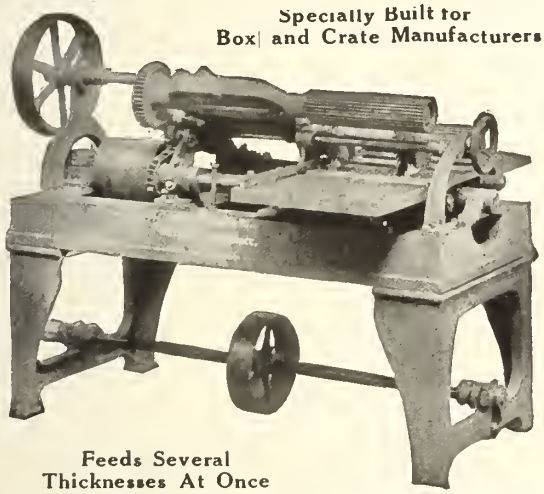
Write for Explanation of our Most Efficient Veneer Package Handling System

E. B. VAN ATTA & CO., INC.
OLEAN, N. Y.

New York City Office: 50 Church St. Chicago Representative: Fader Machinery Company, 549 Washington Boulevard

"The Chattanooga" — Just Another Name For Fast, Economical Gang Ripsawing

Specially Built for Box and Crate Manufacturers



Feeds Several Thicknesses At Once

This latest improved gang ripsaw is powerful, fast, safe and eliminates wastage. For gang sawing boards into strips or head sticks and for ripping veneers it is unsurpassed.

Has powerful feed and securely holds down and feeds short pieces. The feed rolls are automatically adjustable to varying thicknesses. Upper rolls are driven by cut gears, and the lower ones by sprocket chain. Several thicknesses of veneering can be fed thru machine at one time.

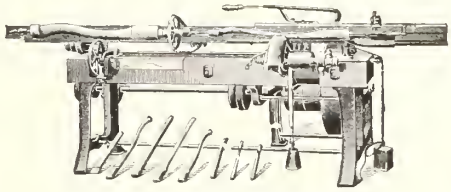
The CHATTANOOGA is an unusually big producer, easily operated, and turns to profitable account short stuff lying around a mill—otherwise wasted.

Attractive price. Complete information on request

Chattanooga Machinery Company
Chattanooga, Tenn.

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.

We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY
Klotz Machine Co.,
Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

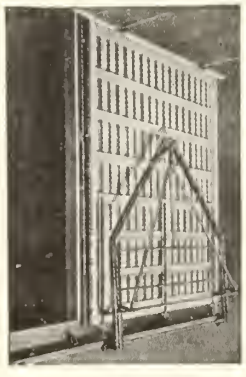
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

896

KILNS REMODELED TO THE GRAND RAPIDS VAPOR PROCESS

Among these are:—

Hayward Lumber Co., - Edmonton, Alberta.
J. & D. A. Harquail, Ltd., - Campbellton, N.B.
Eastern Car Co., - - - New Glasgow, N.S.
Otto Higel Co., - - - - - - Toronto, Ont.
Gourlay, Winter & Leeming, - Toronto, Ont.
Houston Co. Ltd., - - - - - - Tweed, Ont.
Williams Piano Co., - - - - Oshawa, Ont.
Reitzel Brothers, - - - - - Waterloo, Ont.

Are your kilns giving satisfaction? Let us go into this problem with you. No obligation incurred.

GRAND RAPIDS VAPOR KILN
Grand Rapids, Michigan
Western Vapor Kiln Co., Seattle, Washington

BOX NAILS and WIRE for Every Use

We manufacture a complete line of nails and wire in every style and size. Your special needs can be supplied. Write us today. We manufacture special styles to order.

Laidlaw Bale-Tie Co., Ltd.

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

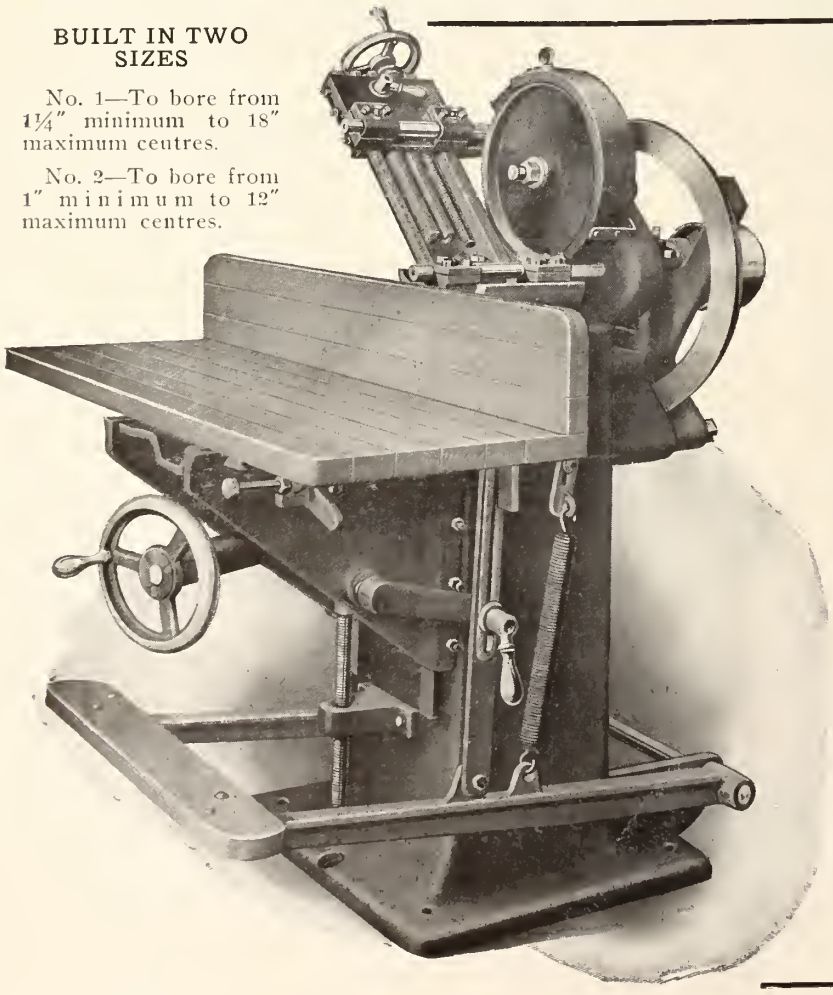
Quite Often

you will find the very thing you are looking for in these advertising pages .It will pay you to read them.

BUILT IN TWO SIZES

No. 1—To bore from 1¼" minimum to 18" maximum centres.

No. 2—To bore from 1" minimum to 12" maximum centres.



VALLEY CITY MACHINE WORKS GRAND RAPIDS MICH. U.S.A.

DOUBLE SPINDLE RADIAL BORING MACHINES

This machine is the standard of the furniture manufacturing world. It is finished with accuracy and combines versatility with never failing reliability.

The table is actuated with a central connecting rod, preventing the bureau drawer effect. The large intermediate gear is supported at any position by the large segment on the rear of the column. This rigid support eliminates the vibration set up by the action of the teeth and materially prolongs the life of the spindles.

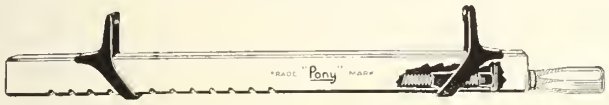
A new **Close Center Attachment** has recently been perfected. It is universal and will bore two 5/16" holes anywhere in a circle of 1¼" with minimum centers of ½".

The new **Quick Action Clamp** attaches to the fence and eliminates the old stick.

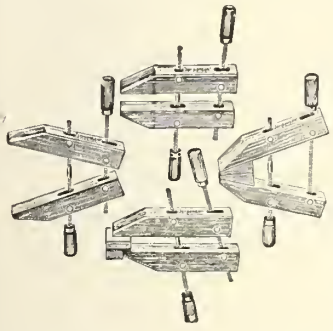
Remember we can bore all of your holes at one time if you so desire

VALLEY CITY MACHINE WORKS
Campau Ave. and Fulton St., N. W.
Grand Rapids, Michigan, U. S. A.

"Pony" Cabinet Clamp



For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.



"Jorgensen"

Peerless Adjustable Hand Clamp

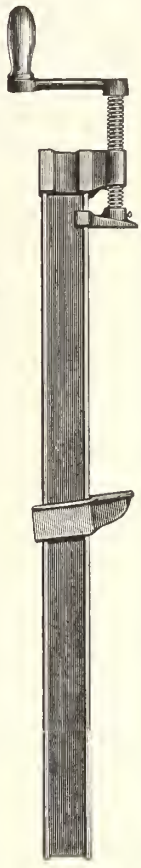
Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

For Sale By

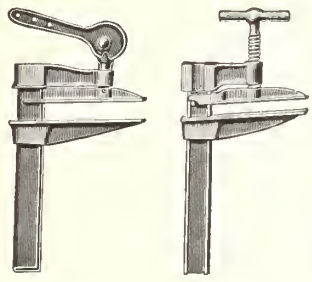
Aikenhead Hardware Limited ..... Toronto
Caverhill Learmont Co. ..... Montreal
Lewis Bros., Limited ..... Montreal



Colt's Clamps

for the

Woodworker



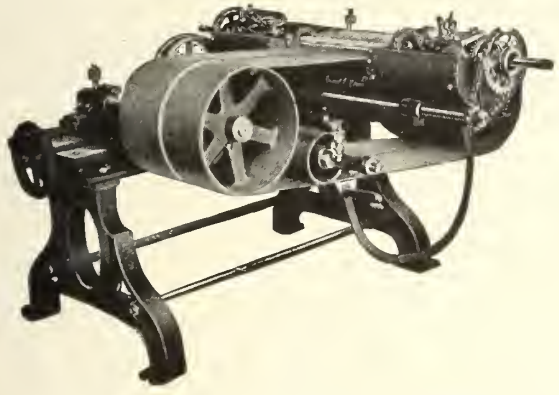
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



Give your Broom Handles a nice Smooth Finish and get Highest Prices for them. The "OBER" Automatic Sander will do the work Rapidly and Economically. We build Laths, Sanders, Rip-Saws, Bolters, chucks, Chucking Machines, etc. for making Handles of various kinds, Ball Bats, Whiffletrees, Neck Yokes, Spokes, Golf Shafts, etc.

Write for free catalogue No. 31.

The Ober Mfg. Co.

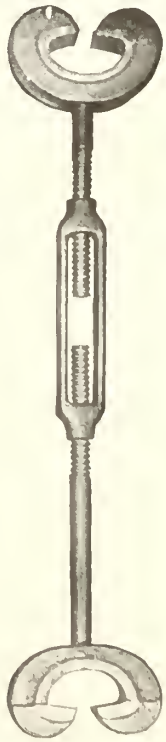
Chagrin Falls, O., U.S.A.

Better work follows the use of the "Empire"

There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

Get in touch with us now. We can make prompt delivery from stock.

We specialize in all types of woodworking tools.



Empire Tool Works

Toronto - Ontario

The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Co., Chicago, Ill.

AROMATIC RED CEDAR
Earthman Lumber Co., Murfreesboro, Tenn.

AUTOMATIC HOLE-CUTTING MACHINE
Virginia Wheel and Hole Sawing Machine Co., Roanoke, Va.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARINGS
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P.B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

B. C. FOREST PRODUCTS
B. C. Lumber Commissioner, Toronto, Ont.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner Mass.
Williams Machinery Co., A. R., Toronto, Ont

BEVEL & MITRE SAWS
Pettingell Machine Co. Amesbury, Mass.

BLOWERS
Canadian Blower & Forge Co., Kitchener, Ont.

BLOW PIPING
Canadian Blower & Forge Co., Kitchener, Ont.
Neville Cooper Co., Toronto.

BOILERS
Engineering & Machine Works, St. Catharines, Ont.

BORING MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Son Co., L. G., Gardner, Mass.
Nash, J. M., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Reynolds Machine Co., Massillon, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont
Valley City Machine, Works, Grand Rapids, Mich.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.
Cary Mfg. Co., Brooklyn, N.Y.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

BUTTONS
Rowe Mfg. Co., Newaygo, Mich.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CARVINGS
Klise Mfg. Co., Grand Rapids, Mich.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.

CARVED WOOD MOULDINGS
Klise Mfg. Co., Grand Rapids, Mich.

CASTERS
Foster, Merriam Co., Merriden, Conn.
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Shurly-Dietrich, Galt, Ont.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Bell Machine Co. Oshkosh, Wis.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company, Preston, Ont.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

CLAMP CARRIERS
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.

CRATING LUMBER
Lloyd, W. Y., Toronto, Ont.
Colborn, C. B., Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D., Guelph, Ont.

CUT-OFF SAWS
Atkins & Co., E. C., Hamilton. Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.
Richards-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

DOWEL MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.
W. S. Hawker Mfg. Co., Dayton, Ohio.

DOWELS
Canada Wood Specialty Co., Ltd., Orillia, Ont
Rowe Mfg. Co., Newaygo, Mich.

DRIERS(Hot Plate)
Merritt Eng & Sales Co., Lockport, N.Y.

DRIERS (Veneer)
Merritt Eng & Sales Co., Lockport, N.Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont
Grand Rapids Veneer Works, Grand Rapids Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Radoliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Simonds Canada Saw Co. Montreal, P.Q.

EDGER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Garlock Machinery Ltd., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.

FEED ROLLS
Atkins & Co., E. C., Hamilton, Ont.

FINISHING PRODUCTS
Campbell Co., M. L., Kansas City, Mo.

FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SKF

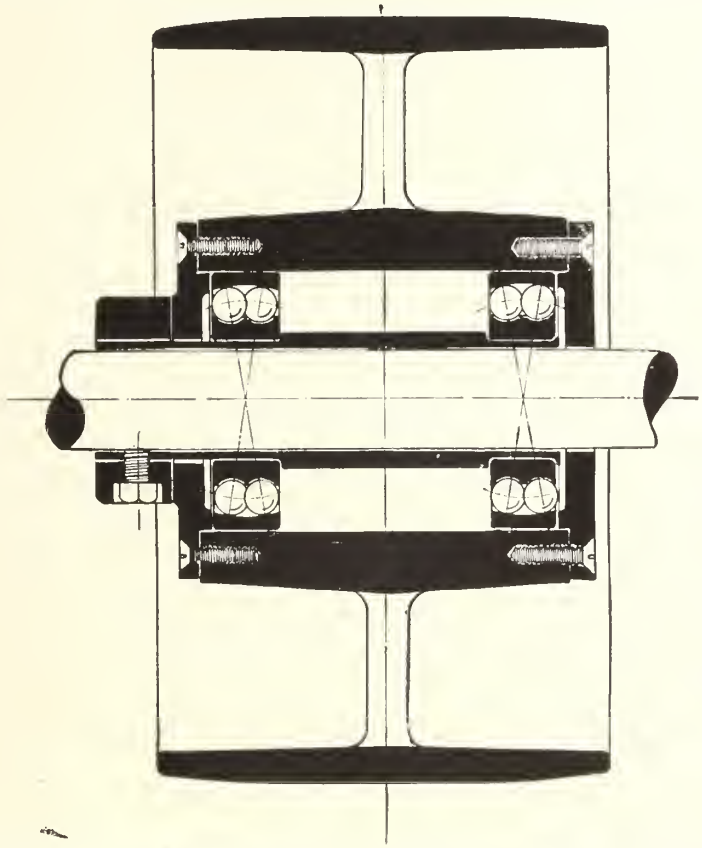
Anti-Friction Transmission

BALL BEARING LOOSE PULLEYS

Simple Construction

Patented

An Assured Remedy for Bearing Troubles in Loose Pulleys



Accurate Design and Balance

Guaranteed to Withstand Any Load at Any Speed Capable of Being Transmitted to Them

These pulleys are now in constant use, day and night in big woodworking plants where high speed and hard usage have caused the failure of all other types of pulleys.

EQUIP THAT TROUBLESOME DRIVE NOW

CANADIAN SKF COMPANY, LIMITED

TORONTO · · MONTREAL

715

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

FASTENERS
Cary Mfg. Co., Brooklyn, N. Y.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y.
Oakey & Sons, Limited, John, London, S.E.I (Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GEARS
Hamilton Gear & Machine Co., Toronto, Ont.

GLUE
Coignet Chemical Products Co., New York N.Y.
Monite Waterproof Glue Co., Minneapolis, Minn.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Rush Lumber Co., Memphis, Tenn.
Thomas & Proetz Lumber Co., St. Louis Mo.
Turner-Farber-Love Lumber Co., Leland, Miss.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.

HARDWOOD DIMENSION STOCKS
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson-Tully Co., Memphis, Tenn.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree Ark.
Clark, Edward & Sons Toronto
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Dudley Lumber Co. Inc., Memphis, Tenn.
Farrin Lumber Co. M. B., Cincinnati, Ohio.
Frye Lumber & Veneer Co., J. W., Dayton, O.
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La
Hafner Manufacturing Co., St. Louis, Mo.
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co. Toronto, Ont.
Kinnon Lumber Co., Ltd., Toronto, Ont.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St Louis, Mo.
May Hardwood Co., R. R. Louisville Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn
Merceau-Hawkins Tie Co., Huntington, W.Va
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont
Pickrel Walnut Co., St. Louis, Mo.
Richards Hardwood Co., Memphis, Tenn
Rush Lumber Co., Memphis, Tenn.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn
Stimson & Co., J. V., Owensboro, Ky.
Sullivan, Frank T., Buffalo, N.Y.
Thomas & Proetz Lumber Co., St. Louis Mo.
Turner-Faber-Love Lumber Co., Leland, Miss.
Vail Cooperage Co., Fort Wayne, Ind.
Whiting Co., Wm. S., Johnson City, Tenn.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.
Van Atta & Co., E. B., Olean, N. Y.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.
Yates Machine Co., P.B. Hamilton, Ont

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PANELS
Calhoun Plywood Co., Sheboygan, Wis.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

LOOK IN THE SCRAP BOX

THERE is much to be learned by looking in the scrap box in any sanding room.

If it is filled with half worn paper or cloth that has dulled too quickly—if it is loaded with scrapped, partly-used belts or paper that has split and peeled long before doing full duty on the machines—then your scrap box is telling you a story of excessive waste—a story of soaring sanding costs.

Carborundum Brand Garnet Paper and Cloth Products because of the unquestioned strength and flexibility of backing—because they are uniformly coated with clean, hard, sharp, North River Garnet—because they hold their grain and produce more work reduce such waste to a minimum.

CARBORUNDUM BRAND GARNET PRODUCTS
MAKE GOOD SANDERS BETTER SANDERS

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y. U.S.A.

New York, Chicago, Boston, Philadelphia, Cleveland, Detroit, Cincinnati, Pittsburgh, Milwaukee, Grand Rapids

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Calhoun Plywood Co., Sheboygan, Wis.
Guelph Patent Cask Co. Scotstown, P.Q.
Wisconsin Veneer Co., Rhinelander, Wis.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Klise Mfg. Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co., Herman, Brooklyn, N.Y.

SASH, DOOR & BLIND MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SATINWOOD
Willey Co. C. L. Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P.B. Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D. Guelph, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW TENONERS
Pettingell Machine Co. Amesbury, Mass.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock Machinery Ltd., Toronto, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW FILING MACHINERY
American Saw Filing Machine Co. Boston, Mass.

SAW TENONERS
Pettingell Machine Co. Amesburp, Mass.

STEEL DOOR MATS
Cary Mfg. Co. Brooklyn, N. Y.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Bruce Woodworkers Ltd. Chesley, Ont.
Walter & Company, B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.

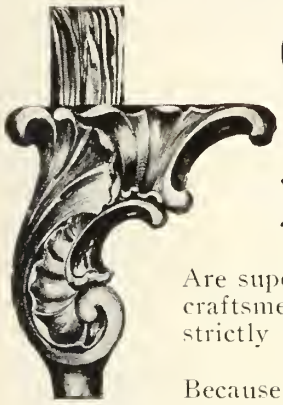
TRIMMERS
Arbuthnot Lumber Sash & Door Co., Vancouver, B.C.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Klise Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.
Walter & Sons, J. Kitchener, Ont.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

TWIST WORK
Klise Mfg. Co., Grand Rapids, Mich.



OVERTON

FINE

Leg Carvings

Are superbly designed by leading craftsmen. The workmanship is strictly high grade.

Because we have a staff of skilled workers and the most improved machinery we are able to turn out excellent workmanship in large quantities on short notice.

Our designing department is at your service We will reproduce your own designs with perfect fidelity.

Write for full information.

S.E.OVERTON CO.
"Our Quality Is Always Higher Than Our Price"
ARTISTIC WOOD CARVINGS

South Haven, Michigan, U.S.A

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY
17 State Street NEW YORK CITY

A Small List Taken From Our Stock of New and Used

Woodworking Machinery

No. 551 C.M.C. chain saw mortiser.
30" Boss double surface planer and matcher.
24" Cowan planer and matcher.
28" Whitney pattern surfacer.
12" Petrie special pattern buzz planers.
Fay horizontal single spindle boring machine.
Jackson-Cochrane horizontal, 5-spindle boring machine.
48" Berlin three-drum sander.
30" Boss double drum sander.
60" Fay & Egan band re-saw.
54" McDonough, horizontal, band re-saw.
42" West Side, power feed, rip band saw.
Humphrey clothes pin lathes and slotters.
American variety woodworker.
Elliot universal motor driven woodworker.

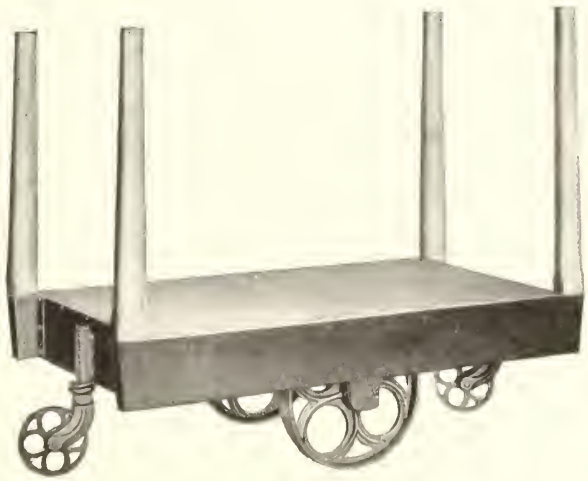
Ask for our complete stock list

Machinery--Transmission Equipment--Small Tools

H. W. Petrie, Limited

131—147 Front Street West
Toronto

NOW IS THE TIME



To Cut Your Production Cost by Using

"GLOBE"

ALL STEEL FACTORY TRUCKS

Made in 3 sizes :
24" x 52" 28" x 58" 34" x 70"

Globe Vise & Truck Co.

GRAND RAPIDS, MICH.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Ault & Wiborg Company, Toronto. Ont.

VARNISH DRYERS
Nicholls Co.. A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Company, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Guelph Patent Cask Co. Scotstown, P.Q.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Northwestern Cooperage & Lumber Co., Glad stone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Wisconsin Veneer Co., Rhinelander, Wis.
Wood Mosaic Co., Louisville, Ky.
Willey Co. C. L. Chicago, Ill.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company. Kitchener, Ont
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.
Van Atta & Co., E. B.., Olean, N. Y.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids. Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Des Moines Sawmill Co., Des Moines, I.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.
Sullivan, Frank T. Buffalo, N.Y.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.

WOODWORKING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Elliot Machinery Co. Belleville, Ont.
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids. Mich.
Pettingell Machine Co. Amesbury, Mass.

WOOD TURNING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Elliott Machinery Co., Belleville, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P.B. Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

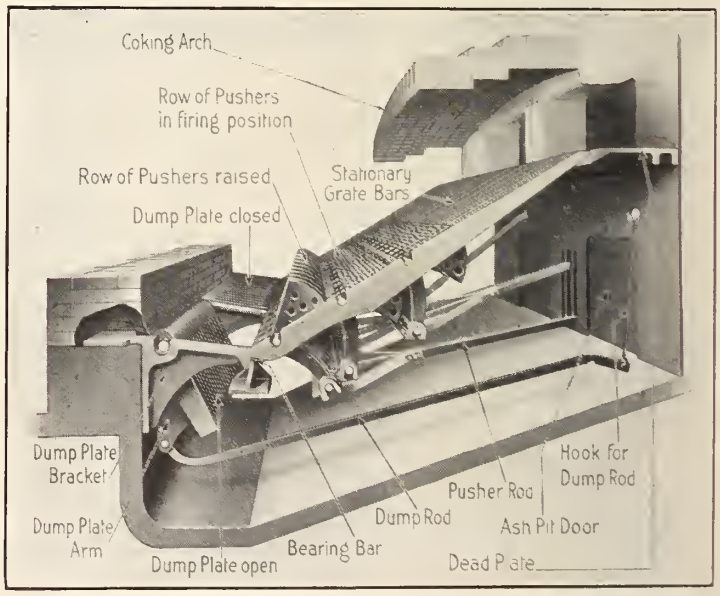
WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WIRE BOX STRAPPING
Cary Mfg. Co. Brooklyn, N. Y.

National Hand Fired Stokers

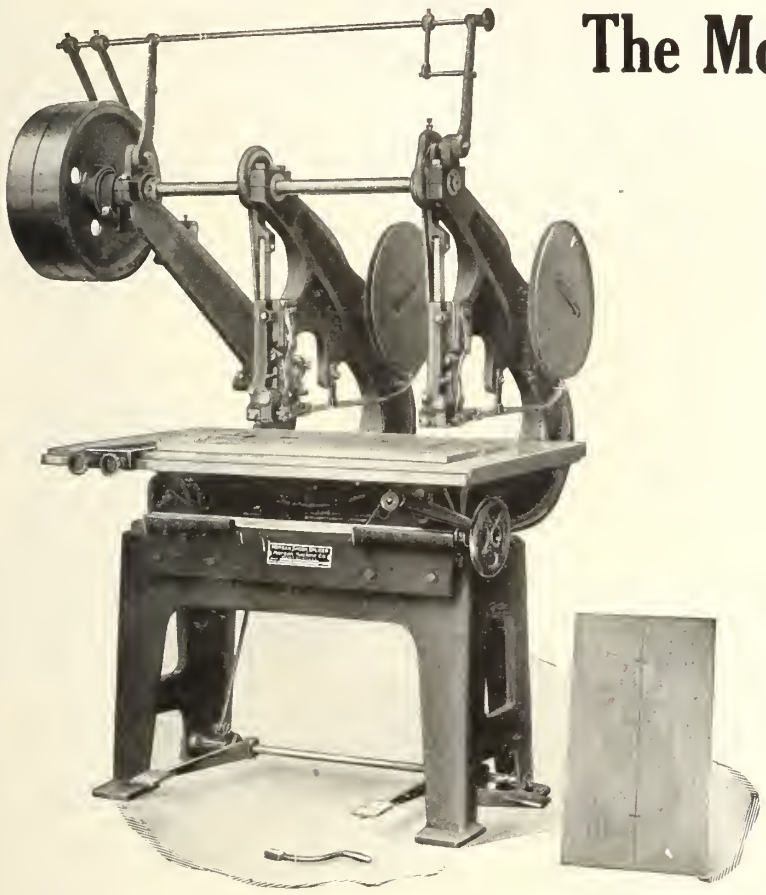
For the plant—medium size or small—that wants to cut down its boiler room staff—to get better stoking with ordinary common labor—to obtain overall efficiency of furnace and boiler of at least 70% with a big variety of fuels—the National Hand Operated Stoker is the best investment that can be made. Clean, steady fires with even refuse for fuel, common labor as firemen, is its welcome contribution to the reduction of your overhead expense.

Made by us in Canada. Let us send you illustrated descriptive booklet.



Engineering and Machine Works of Canada, Limited
St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal

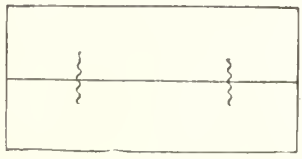


The Morgan Shook Splicer

uses narrow stock

It automatically feeds, cuts and drives corrugated fasteners. Adjustable—handles fasteners from 1/4″ to 7/8″ in width and from 3/4″ to 1 1/4″ in length.

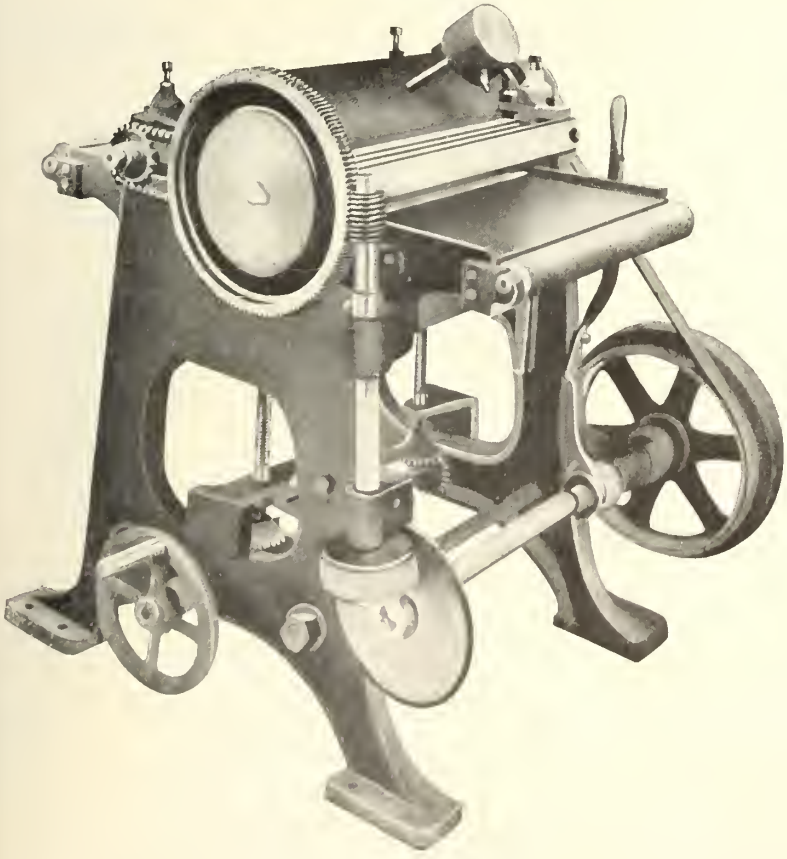
Speed, Accuracy, Economy



We manufacture Matchers, Printers and Nailing Machines.

WE INVITE YOUR INQUIRY

Morgan Machine Co.
Rochester, N. Y.



The Elliot Bull Dog Planer

6″ x 16″

The facts that the head is run by a worm gear; no pinions on the head and that the feed rolls are driven independent of the head excludes vibration. Hence—it planes smoother than any other Pony Planer made. Also it uses less power.

Write for Prices and Catalogue

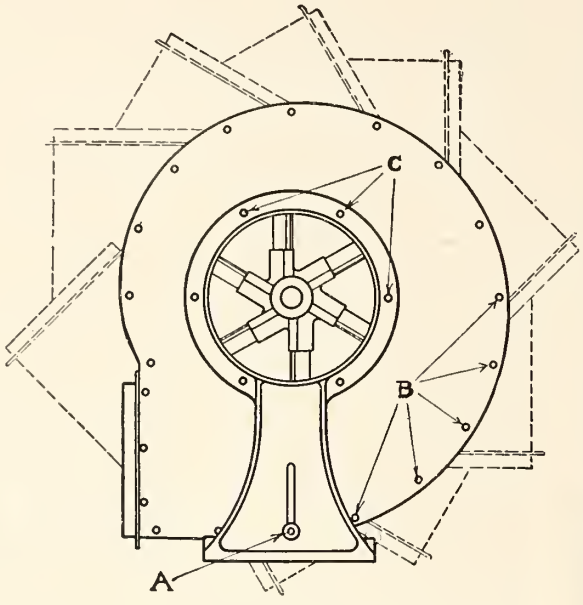
Elliot Machinery Co.

Limited

Belleville, - - - Ontario

CANADA

Canadian Mill Exhausters



One of the features of the Canadian Planing Mill Exhauster is the reversible housing. It is easily adjustable to either hand and to any discharge.

By this arrangement one fan may be used to meet all requirements, thus eliminating crossed belts and sharp angles.

Let our engineering department help you plan your refuse exhauster system.

Write for catalogue 400-13.

Canadian Blower & Forge Co.
KITCHENER, ONT.

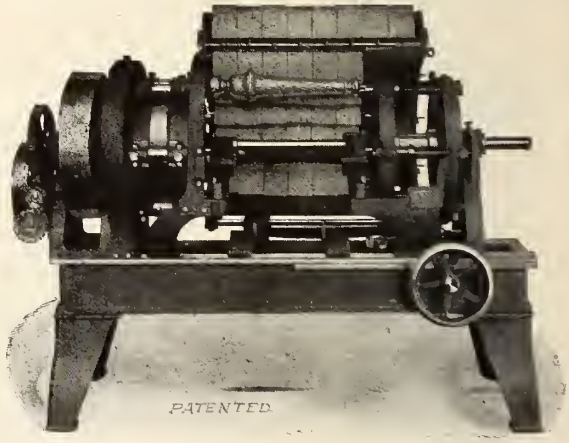
We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.

Your Furniture Turnings



Should not cost you so much for sanding (if you are sanding them by hand), for the Nash sander can do the work much cheaper and the quality of the sanding is much superior to that obtained by any other method.

Ask me to prove it

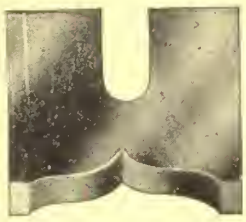
J. M. NASH, Milwaukee, Wis.

ATKINS

STERLING QUALITY

SAWS and KNIVES

ECONOMIZE



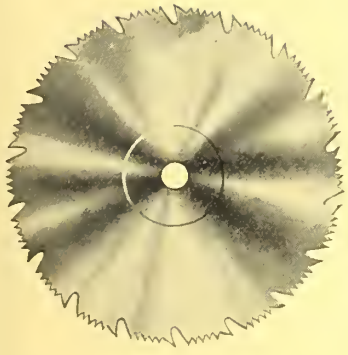
ARE your saws and knives wasting your lumber? If so, why not turn that waste into a profit by installing

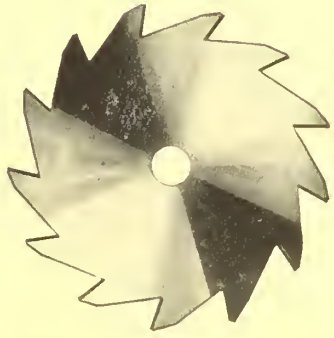
Atkins Sterling Quality Saws

and Machine Knives

Some of the largest woodworking mills in the country are using Atkins Saws exclusively, because they increase production, stop waste and make a name for themselves wherever they go.

Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.





E.C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

MADE IN SCOTLAND

BOX NAILING and CLEATING MACHINES

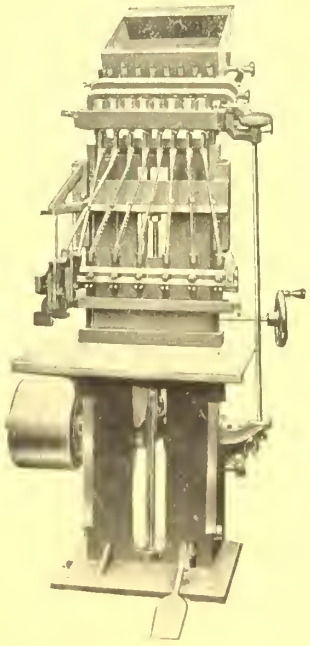
ENTIRELY AUTOMATIC
EASILY OPERATED
INSTANTLY ADJUSTED

MACHINES FOR PLAIN or ZIGZAG NAILING
CLEATING or BATTENING

OUR { MACHINES / PRICES } ARE RIGHT

CATALOGUE FOR THE ASKING

IN ALL SIZES

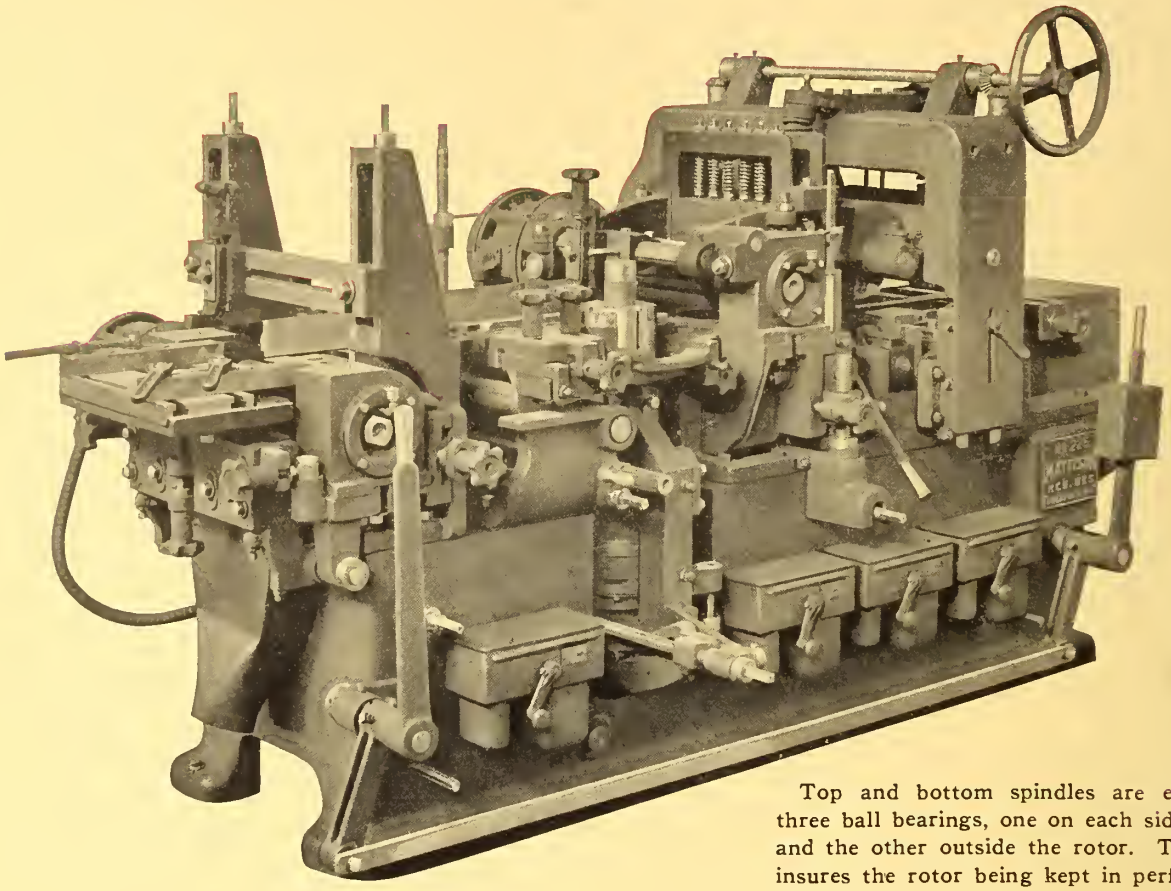


CABLES
"PARALLEL
GLASGOW"

MATHEW WYLIE & CO. LTD.

81 PORTMAN STREET GLASGOW

Production Demands the Electric Moulder

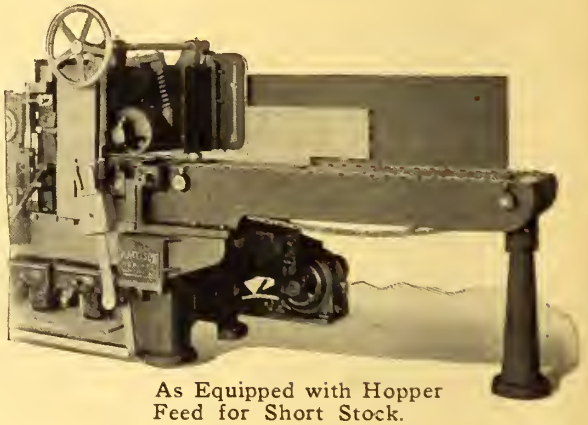


Top and bottom spindles are each provided with three ball bearings, one on each side of the cutterhead and the other outside the rotor. This outside bearing insures the rotor being kept in perfect alignment with inside walls of field coils.

TEN years ago, when a man bought the latest and most efficient type of moulder, it was a belt-driven machine. Yet, it was the best he could get.

But today, even if he selects the most efficient and up-to-date type of belt-driven moulder, he is still getting a machine that is already out-of-date. For the advent of the Motor-Driven Moulder marks the opening of a new era in moulder construction; and from now on the motor-driven type will, without a doubt, gradually replace the belt-driven moulder in all modern plants.

The Mattison Electric Moulder, with its powerful, individually controlled motors for each head and the feed works; with its removable outside bearing, and accessibility for quick set-ups, marks a wonderful advancement in moulder construction.



As Equipped with Hopper Feed for Short Stock.

Ask us to send our Illustrated Bulletin Explaining Construction

MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.

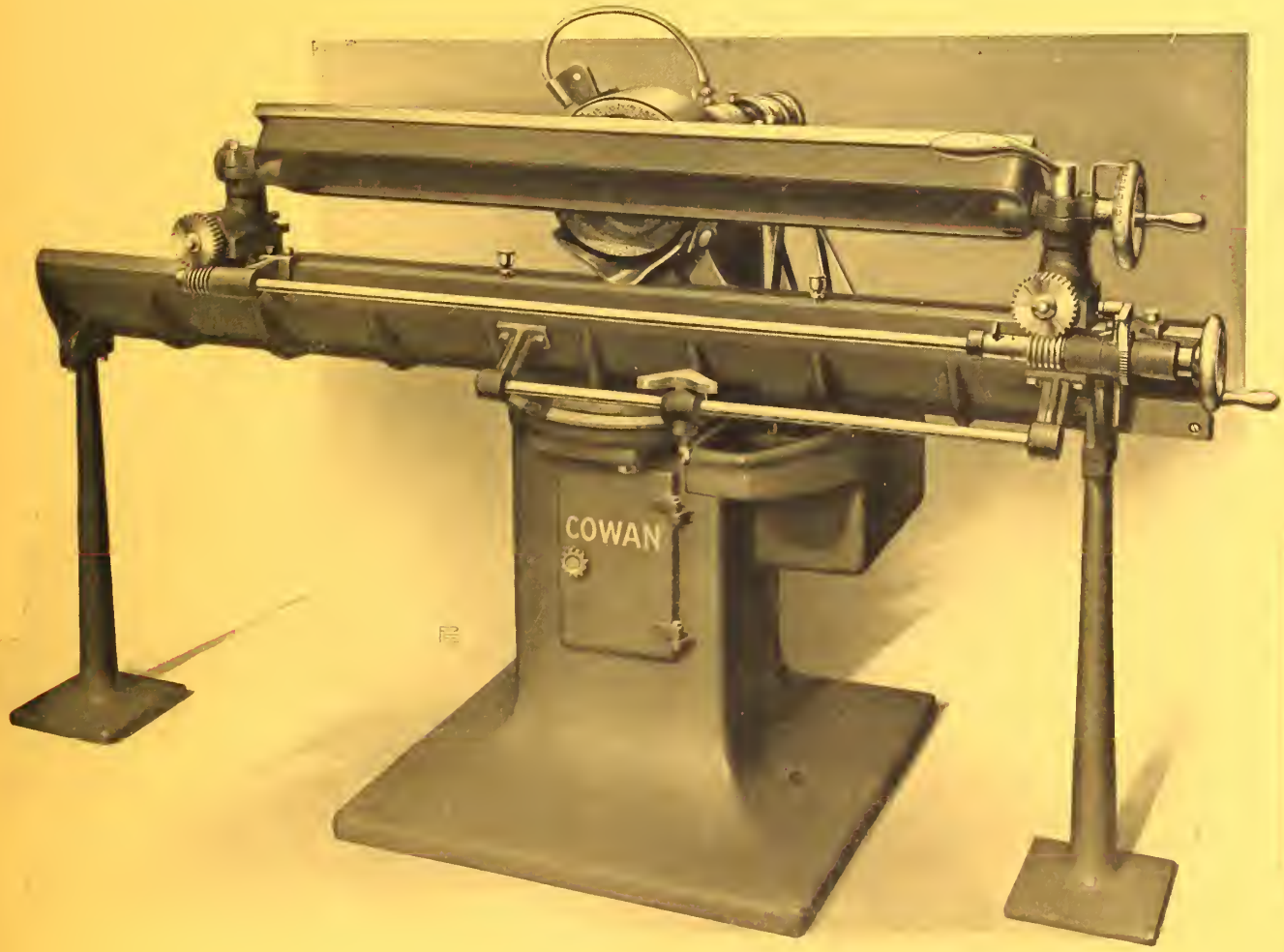
Volume Twenty-Two TORONTO, June, 1922 Number Six

CANADIAN WOODWORKER and Furniture Manufacturer

A CANADIAN MADE KNIFE GRINDER

FULLY AUTOMATIC

26″ to 48″; Cup Wheel; With Water Attachments. Finest Manufactured.



COWAN & COMPANY OF GALT LIMITED

Galt Canada

Alphabetical Index to Advertisers, Page 12

Prepare to make

RADIO CABINETS

An opportunity to get in on the ground floor

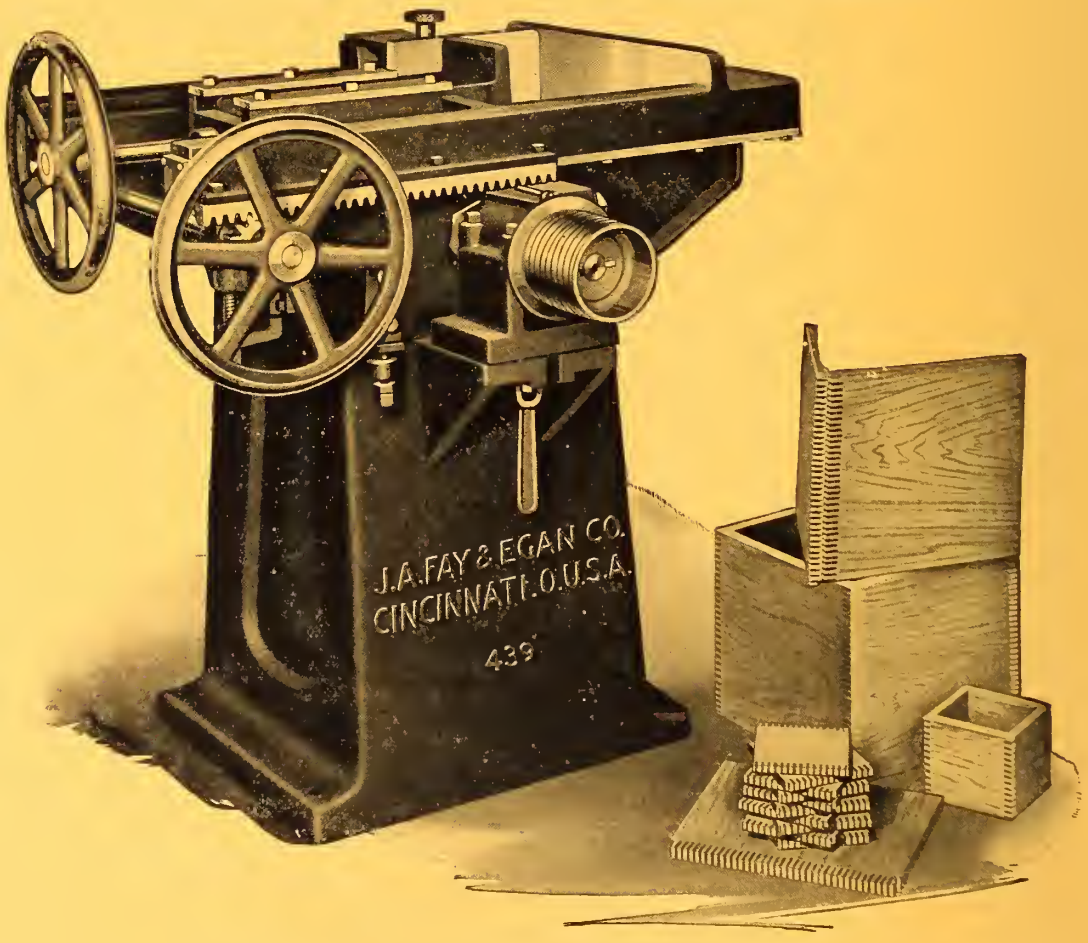
There is an enormous demand for this product which is right in its infancy

Initial cost of necessary equipment very small

With our

NO. 439 LOCK CORNER BOX MACHINE

you will be able to produce these cabinets in quantities



We will give you complete details for the asking

J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St. - - Cincinnati, Ohio, U. S. A.

Exclusive Agents for the Dominion: A. R. Williams Machinery Company, Ltd., Toronto, Ont.
Branches: Montreal, St. John, N. B., Winnipeg, Vancouver

Another "Made In Canada" Product

Re-Drier for Veneers

A most essential and money saving-machine for your Veneer Room.

We can show you this machine in operation—also under construction. Let us give you full particulars for your plant requirements.

A few more machines in our stock in addition to those advertised last month:—

54" McGregor Gourlay Band Re-Saw.

24" Jointer Herzog Power Feed Attachment

Monarch 36 x 72 Hydraulic Veneer Press, pump, trucks, retainer rods complete.

McGregor Gourlay Double End Tenoning Machine, Copes cut off saws.

Surfacers Single and Double for Cabinet Shop and Box Factory.

Cross cut saws.

Rip saws.

Railway cut off saws.

Fast Feed 15" Planer and Matchers with and without Feeding Tables.

And many other machines for Sash and Door, Cabinet, Box Factory, and Planing Mill work. All in A1 shape and all subject to prior sale.

Send us your Inquiries

Garlock Machinery Limited

163 Dufferin Street

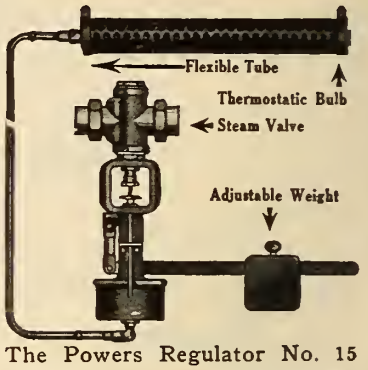
WINNIPEG - TORONTO - MONTREAL

Everything in Woodworking and Metal Working Machinery

Man's Hand Less Accurate Than Machinery

A man's eye watching the thermometer. A man's hand turning the valves. He does his absolute best but you know his results cannot be uniformly right and perhaps the glue pot got too cold or the drying room too hot.

Automatic Heat Control Stops Waste



The Powers Regulator No. 15
Specially designed to control temperature in dry kilns, ovens, varnish and dry room. Entirely automatic.

Eliminate the human element—guesswork—by applying the Powers Automatic Heat Regulators. They are scientifically constructed; made to operate according to certain known physical laws. Manufactured in a great variety of types suited to practically any heat regulation condition.

Your own problem can be solved. It is worth your while to investigate.

The Canadian POWERS REGULATOR CO Ltd
Specialists in Automatic Heat Control
82 CHESTNUT ST., TORONTO, ONT.

In our thirty years of experience and study we have effected substantial economies for many users. We can do the same for you.

(1774)

DUNLOP BELTS

Respond with Economy and Long Life to all Woodworking Uses

They are built with an eye to long Service.

They save machinery by their ability to run smoothly and easily, yet they transmit the required power.

The special frictioned-surface of "Gibraltar RedSpecial," and the great flexibility of this Belt, ensure close pulley contact. It masters straining drives and off-and-on-loads.

Heat and cold, wet and dryness, do not affect it.

The Dunlop process eliminates stretch. This saves constant adjustments and undue waste of time.

For belt Economy and Belt Efficiency use "Gibraltar RedSpecial" frictioned-surface. This Belt will adapt itself to any drive.

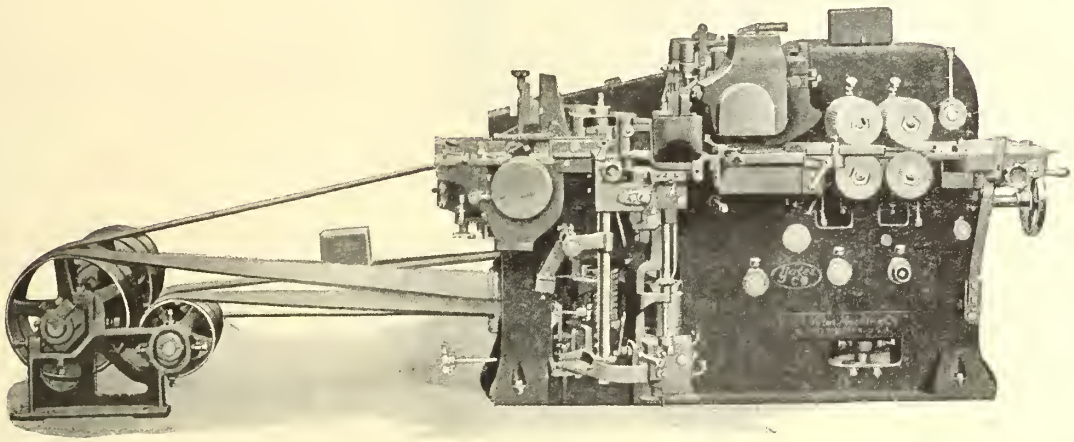
Dunlop Tire & Rubber Goods Co., Limited

Head Office and Factories: TORONTO

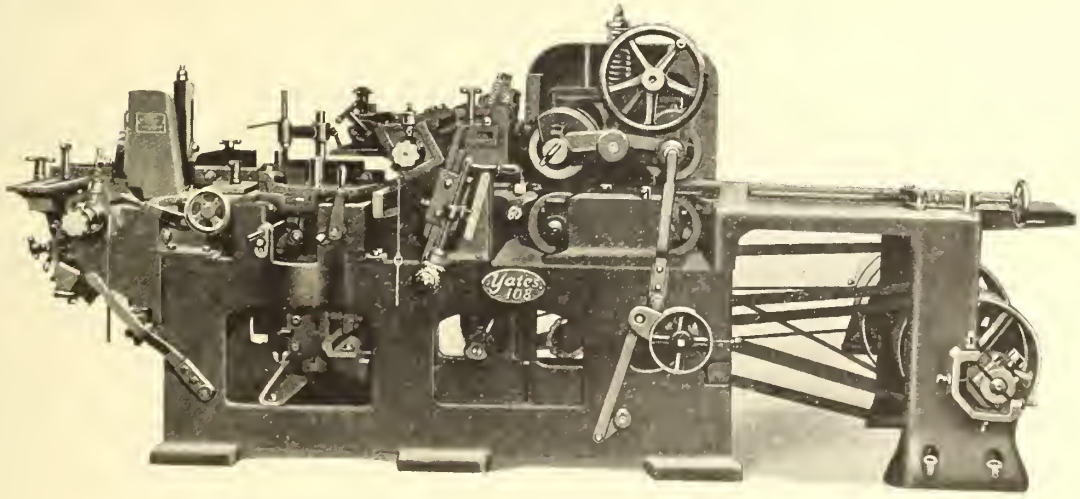
Branches in the Leading Cities

There Are None Better

Yates



Type "C" Moulder built in two sizes
C3 4x4 - C4 4x8

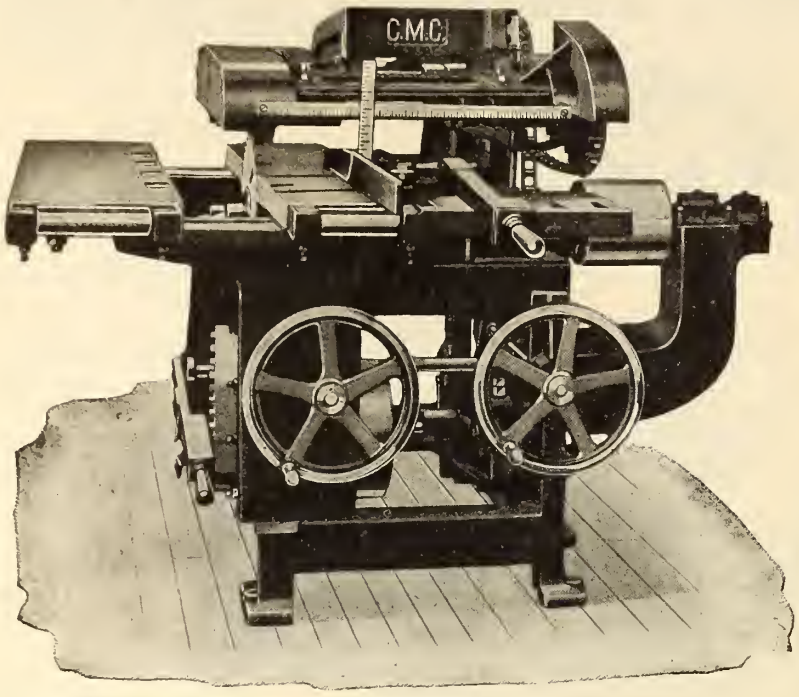


No. 108 Moulder built in three sizes
10"—12"—15"

Each of the machines shown above is a premier moulder for the work to which it is adapted.

Full descriptive circulars on either machine or both will be sent you upon request.

P. B. Yates Machine Co. Ltd.
Hamilton, Ont. Canada



C.M.C.

DESIGNED for SERVICE

No. 605 Self Feed Rip Saw

The man who uses a machine is the man who knows best what features are of the most value. He knows how it should be built—where strength is required and what adjustments are handiest and most reliable.

Too often in the past, machines have been designed by men with little practical or operating experience—one designer following more or less blindly, for better or for worse, the ideas and outlines laid down by those before him.

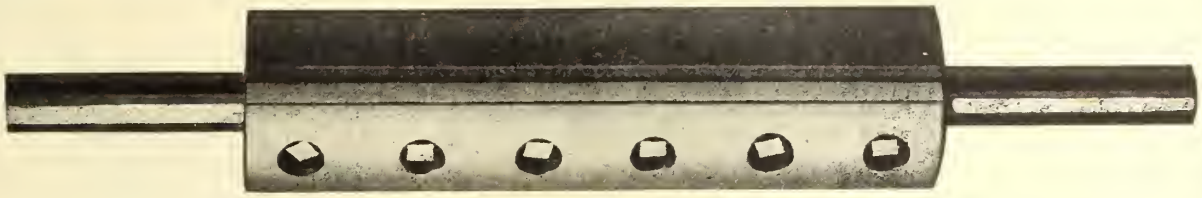
In developing our new No. 605 Self Feed Rip Saw, there was no copy-cating; Every feature and facility was carefully considered from the standpoint of service. We put ourselves in the operator's place and consulted many of the brightest and most experienced saw men in the country, with the result that we believe we have at last put before the woodworking trade a machine that is unique, in that it is strong and sure, that it is handy, that it is safe to operate, and that it will outwear with less upkeep any similar machine on the market. Thorough examination of this Saw and detail comparison with other makes only brings out its good points. The more you see of it the better you will like it.

Better have a CMC man call and tell you of its many good points of superiority or ask for special bulletin which we will gladly send you.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721 Bank of Hamilton Building

The Shimer Round Safety Cylinderwith High Speed Knives



A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

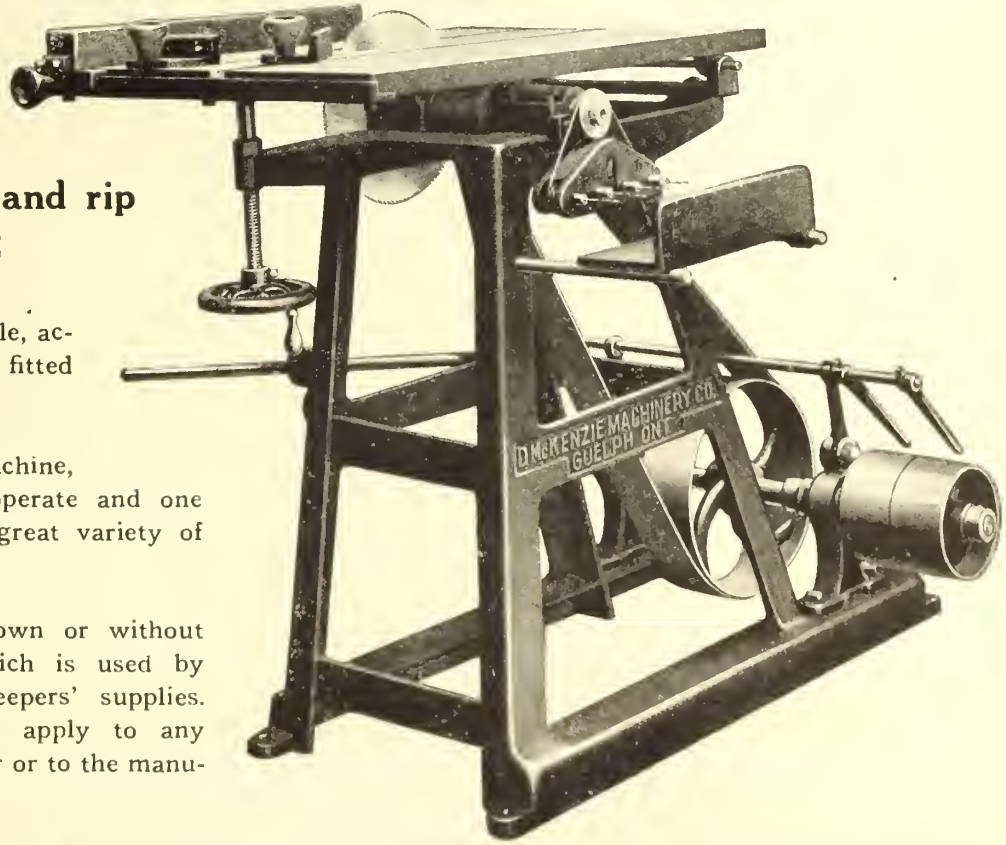
WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

McKenzie



Cross-cut, mitre and rip Saw No. 2

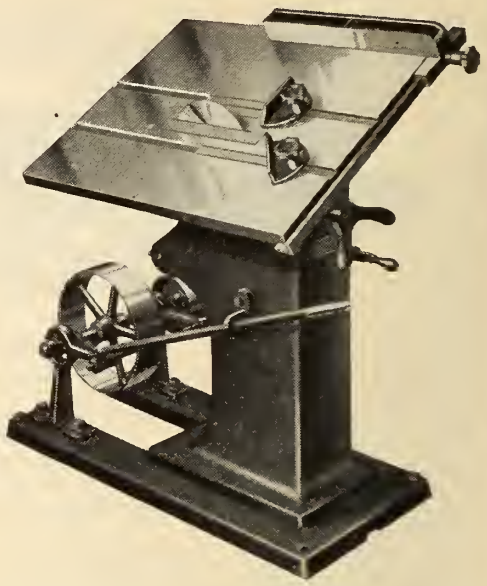
All iron frame and table, accurately machined and fitted insuring good work.

A light inexpensive machine, handy and simple to operate and one which will turn out a great variety of work.

Sold complete as shown or without drilling attachment which is used by manufacturers of beekeepers' supplies. For further particulars apply to any reliable machinery dealer or to the manufacturers.

D. McKenzie Machinery Company, Guelph, Ont.

The "WILLIAMS" Saw Table



The "Williams" Light Variety Saw Table will prove of interest to the Furniture Manufacturer for Assembly and Repair Departments, Small Jobbery Shops, Repair Shops, Pattern Makers' Shops, Beekeepers Supply Shops, Shipping and Factory Maintenance Departments, and a number of other uses where a rapid and accurate tool is required for light work.

HERE ARE SOME SPECIAL VALUES

SINGLE SURFACE PLANERS

1—New 20" eclipse, top and bottom rolls driven.
1—Used Harper 16", top rolls only driven.
1—Preston 24" str. roll, No. 121, Used.
1—Used 24" Cowan, double belted.
1—New No. 123A, Preston, Ball-...bearing, sectional rolls, sectional chipbreakers.

PLANERS AND MATCHERS

1—Used Harper, 24".
1—Used 24" Cowan Double Surface short bed.
1—New Fay & Egan No. 112 Lightning Flooring Planer.
1—Used Cowan 24", long bed type.

BAND SAWS

1—New Moak, 36" with aluminum top wheel.
1—36" Yates Used.
1—26" Cowan, New.

If It's Machinery—Write "Williams"

MISCELLANEOUS

1—New No. 107 Crescent Woodworker, five machines in one; 26" band saw, 12" jointer, saw table, boring machine, shaper.
1—New Beach contractor's woodworker—saw table, jointer, boring attachment, portable.

The A. R. Williams Machinery Campany Limited

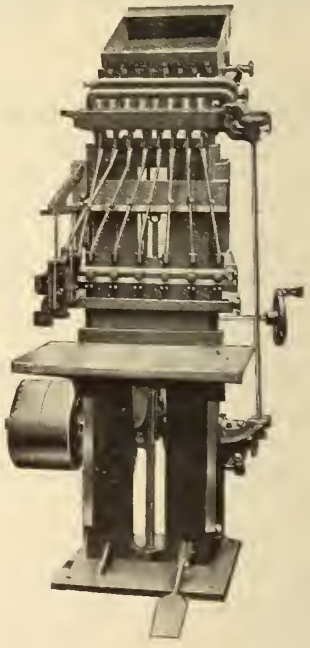
64 Front Street W. TORONTO Phone Adel. 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractor's Machinery, Electric Motors, Saw, Shingle and Lath Mill Machinery, etc.

Halifax, St. John, Montreal, Winnipeg, Toronto, Vancouver

MADE IN SCOTLAND

IN ALL SIZES



BOX NAILING and CLEATING MACHINES

ENTIRELY AUTOMATIC
EASILY OPERATED
INSTANTLY ADJUSTED

MACHINES FOR PLAIN or ZIGZAG NAILING
CLEATING or BATTENING

OUR { MACHINES / PRICES } ARE RIGHT

CATALOGUE FOR THE ASKING

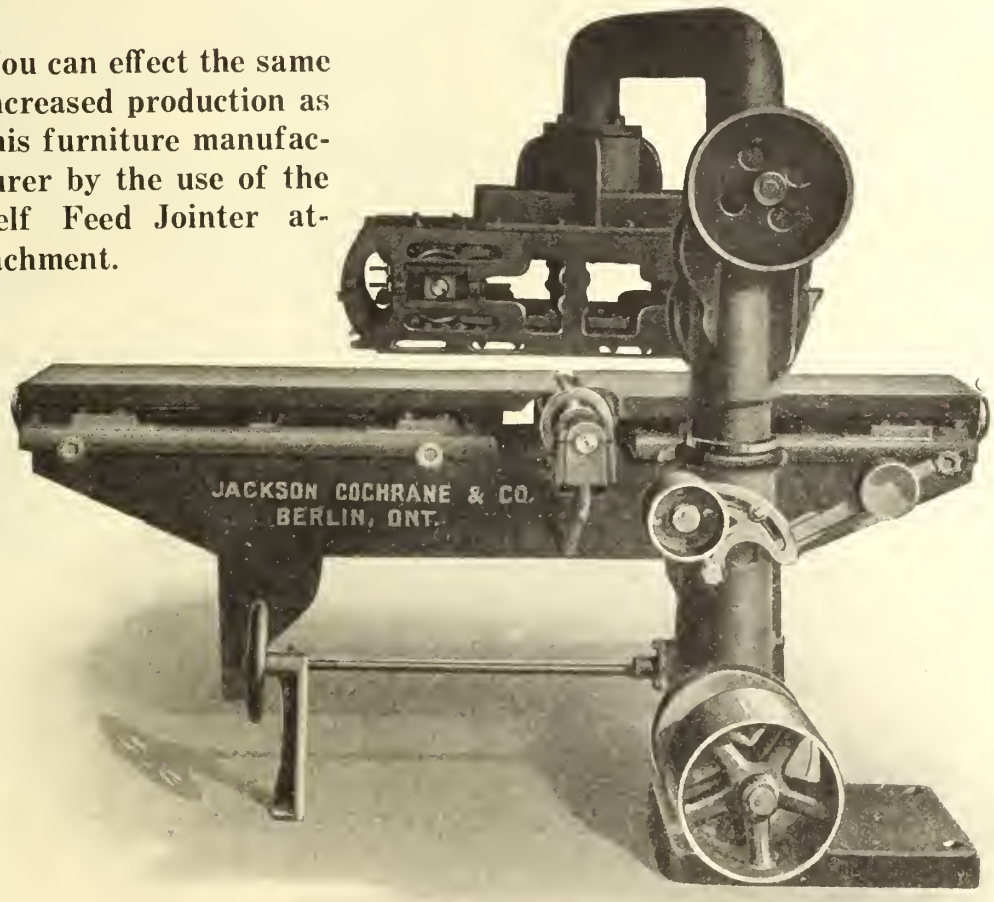
CABLES
"PARALLEL
GLASGOW"

MATHEW WYLIE & CO. LTD.

81 PORTMAN STREET GLASGOW

"We can Feed from Two to Three Times as Fast as Formerly"

You can effect the same increased production as this furniture manufacturer by the use of the Self Feed Jointer attachment.



For factories having but one or two jointers and desiring to use same at times for squaring or edging, this Herzog Swing Out Jointer Attachment is especially desirable, as the attachment can be quickly swung free from the jointer.

It is the same general design as the four post machine except that the feed is shorter and is hung from a single post. We guarantee this machine to increase the capacity of the hand fed jointer from THREE TO FOUR TIMES.

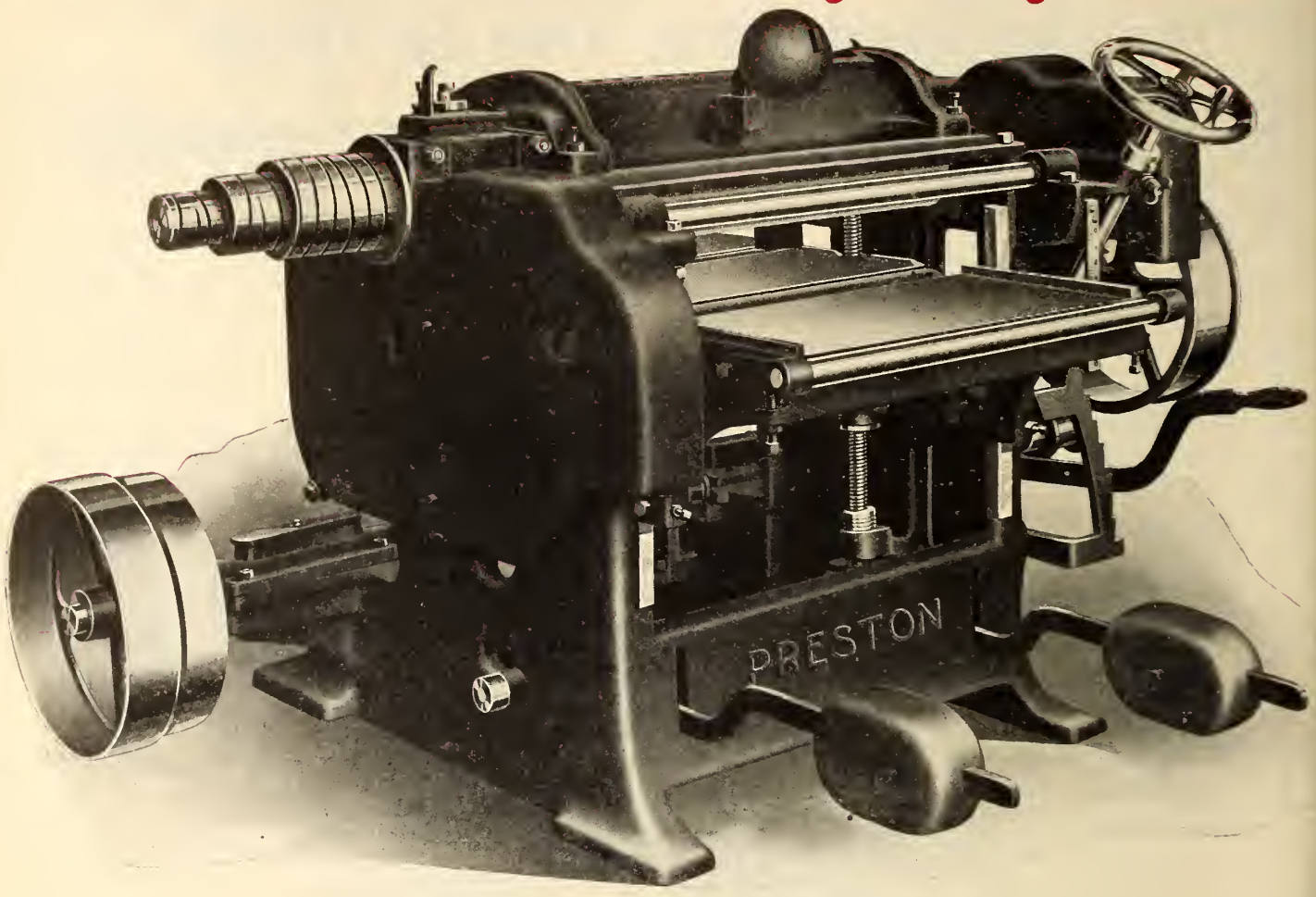
One user writes "We would not be without this machine as it has proven one of the very best machinery investments we have made.

Read over the article on the Self-Feed Jointer Attachment contained elsewhere in this paper.

Jackson, Cochrane & Company

KITCHENER - CANADA

No. 121 "Preston" Heavy Pony Planer



Cut Showing Standard Machine (note Guards)

This is our No. 121 Planer of improved design as now built

Planes 20″ and 24″ wide. 8″ thick

Features:—

1. Built with Straight Rolls (Standard Machine)
   or Divided Roll
   or Sectional Roll and Sectional Chipbreaker
2. Built with Square Cylinder with 2 carbon knives (Standard Machine)
   or Round Cylinder with 4 High Speed Knives.
3. Equipped with Whitney Type Babbitt Bearings (Standard Machine)
   or Specially selected SKF Ball Bearings.
4. Equipped with Stockbridge Electric Knife Grinder if desired, at extra cost.

Cylinder driven from one or both ends.

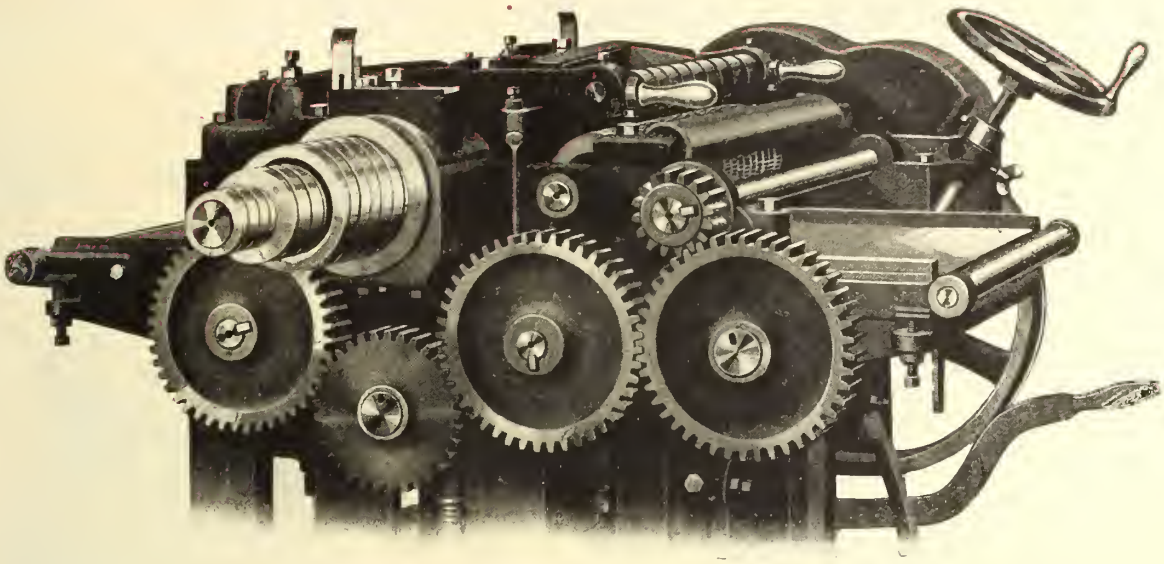
Every known improvement is embodied in this "Preston" Planer and in it we have produced a small planer which in quality and quantity of work produced will compete successfully with larger and higher priced machines

The Preston Woodworking

PRESTON,

We are Sole Manufacturers of and Agents in Canada for the Eaglesfield Patented Beltless Swing Saw

No. 121 "Preston" Heavy Pony Planer



Above cuts show Machine equipped with

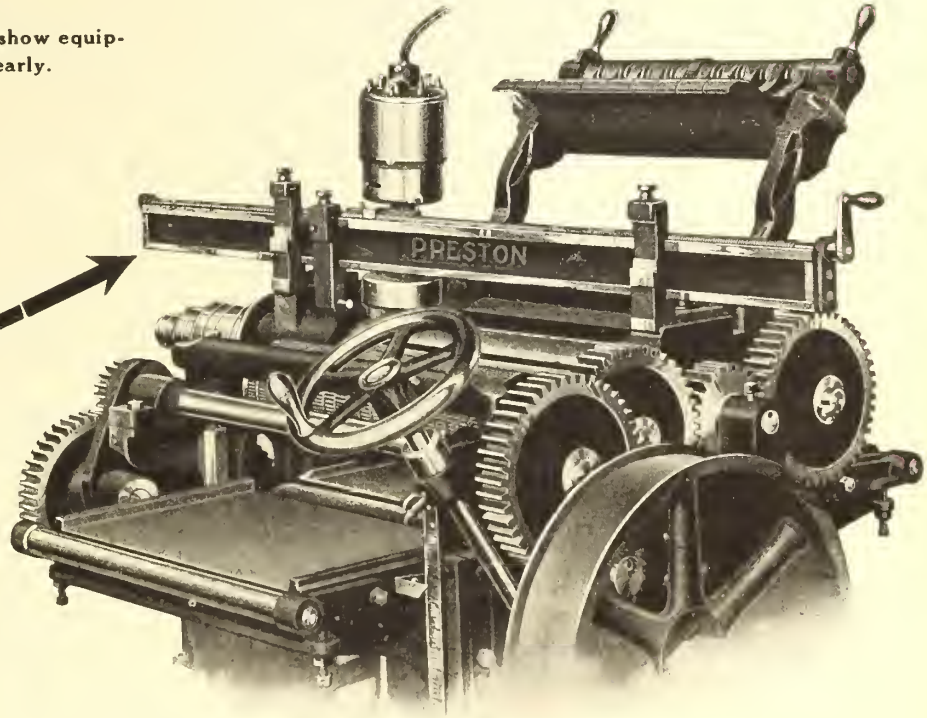
1. Specially selected SKF Ball Bearings.
2. Round Cylinder with 4 High Speed Knives.
3. Sectional Roll.
4. Sectional Chipbreaker.

N B. Guards are removed to show equipment and construction more clearly.

Cut at right is same as above but shows machine equipped as well with

Stockbridge Electric Knife Grinder and Jointer

with which the Cylinder Knives are ground and jointed right in their place on the machine.



We would like to talk "Planer" to you whenever you are in the market

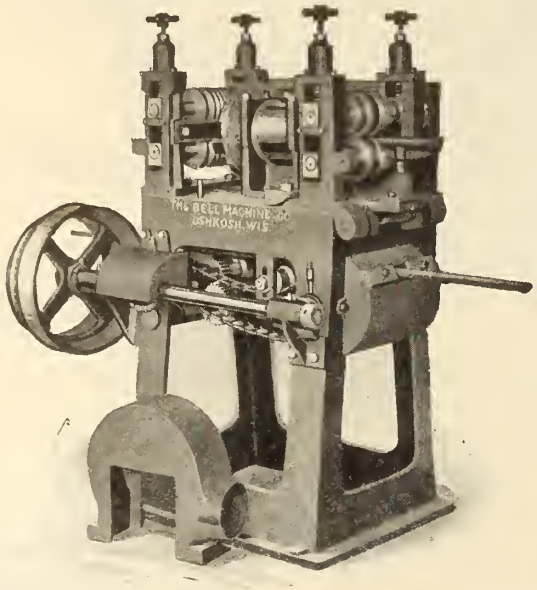
Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

Make Your Own Dowels With the "BELL" Machines

The Fastest and Most Practical Equipment For the Purpose



Adjustable Rod and Dowel Machine

The fastest dowel machine in the world.

Constructed to withstand the heavy and constant strain to which this type of machine is subjected.

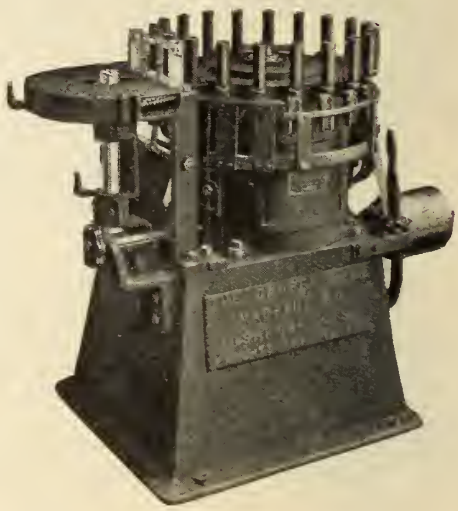
Equipped with a universal four-knife cutter head adjustable to turn rods of all diameters from ¼" to 2" in either plain, spiral groove, longitudinal groove, or imitation reed wind. Special machine for turning rods of larger size.

Cutter-head mandrel is mounted at each end in ball-bearings of the highest grade.

Out-going feed rolls have combination of grooves so that many sizes can be made without changing feed rolls. The in-going feed rolls are adjustable for all sizes of squares.

Will work stock as short as 4½ inches.

Furnished with countershaft or motor drive.



Dowel Cutting Off and Pointing Machine

This machine is for cutting off and pointing dowel pins from long rods.

It will cut and point dowel pins of all diameters up to ¾", and in any length up to 6 inches.

Capacity of this machine is from 300 to 400 pins a minute. Any boy can operate it.

All working parts are completely enclosed and thus protected from dust and dirt.

Absolutely no danger to operator.

The floor space required by this machine is only 22" x 36".

Tight and loose pulleys on machine.

Furnished with belt or motor drive.

MANUFACTURED BY

The Bell Machine Company

(Successors to the Dauber-Bell Machine Co.)

Oshkosh, Wisconsin, U.S.A.

Representatives:

For Great Britain: THE OLIVER MACHINERY CO., 201 Deansgate, Manchester, England

For Canada: THE A. R. WILLIAMS MACHINERY CO. LTD., Montreal, Toronto, Winnipeg

National Kilns Under Construction

Below we show a cut of three National Automatic Humidity Controlled Dry Kilns being constructed at the plant of the Watt Milling & Feed Co., Ltd., Toronto, Ont.

This firm manufactures an excellent line of hardwood flooring, sash, doors, interior trims, etc. Their requirements for dry kilned lumber cover a wide range of species and thicknesses; therefore their kilns must be flexible, so as to enable the operator to secure the various conditions required in the proper drying of the many classes and thicknesses of hard and soft woods.

It was only after a thorough investigation and careful consideration that the Watt Milling & Feed Company came to the conclusion that the NATIONAL AUTOMATIC HUMIDITY CONTROLLED KILN was the Best kiln for their particular requirements. The National is not a One-way dry kiln. Its operation is absolutely under control of the operator and the exact conditions required for drying any class of woods can be secured and maintained at his option. It is designed for power—plus flexibility.

"The First Kiln in 6,000 Years in Which Humidity is Automatically Controlled."

If you are in need of new kilns or the improving of your present installation, we will appreciate the opportunity of working with you. Kindly write to-day and give us details as to your problems. This will not obligate you in any way.

The National Dry Kiln Co., 1117 East Maryland Street., Indianapolis, Indiana

OR

C. A. FIELDS, Canadian Representative, P. O. Box 55, TORONTO, ONT.

NATIONAL DRY KILNS

Alphabetical List of Advertisers

Adjustable Clamp Co. 113
American Hardwood Lumber Co. 27
American Saw Filing Machine Co. 103
Anderson Tully Co. 97
Atlantic Lumber Company 16
Atkins & Co., E. C. 123
Atlas Mfg. Co., of Orlando 109
Ault & Wiborg Co. 77

Bachman Co., F. M. 94
Batavia Clamp Co. 113
Banning, Leland G. 49
Behr Co., Inc., Herman 24
Bigelow-Cooper Lumber Co. 47
Barr-Holaday Lumber Co. 35
Bell Machine Co. 12
Birds Eye Veneer Co. 80
Black Bros., Co. 111
Blockson & Co. 72
Bonner & Sons, J. H. 41
Bruce Woodworkers Ltd. 31
Bruce Company E. L. 49
Buffalo Hardwood Lumber Dealers 42
Bury & Co., Robt. 50

Calhoun Plywood Co. 39
Canada Machinery Corporation 6
Canada Wood Specialty Co. 46
Canadian Appraisal Co. Ltd., The 17
Canadian Blower & Forge Co. 122
Canadian General Lumber Co. 105
Canada Glue Co. 20
Canadian Nashua Paper Co. .....
Canadian Powers Regulator Co. 4
Canadian S. K. F. 115
Cannon Canadian Co. Ltd. 20
Carborundum Co. 117
Carter & Co., E. T. 77
Cascin Mfg. Co. 20
Celluloid Zapon Co. 78
Central Veneer Co. 85
Chapman & Dewey Lumber Co. 32
Clamp Nail Co. 109
Clarke Edward & Sons, Ltd. .....
Coignet Chemical Products Co. 119
Colborn, C. B. 40
Comfy Cushion Co. 73
Cosmos Chemical Co. 29
Cowan & Co. 1
Cutler Desk Co. 29

Decorators Supply Co. 27
Delaney & Pettit Limited 74
Des Moines Sawmill Co. 36
DeVilbiss Mfg. Co. 79
Dominion Appraisal Co. 17
Doon Twines 74
Dry Kiln Door Carrier Co. 111
Dunlop Tire & Rubber Goods Co. 4

Eagle-Ottawa Leather Co. 72
Eaton & Sons, J. R. 30
Elliot Machinery Co. 121
Engineering & Machine Works of Canada Ltd. 120
Empire Tool Works 113

Farrin Lumber Co., The M. B. 50
Fay & Egan Co., J. A. 2
Foster, Merriam Co. 25
Frye Lumber & Veneer Co., J. W. 84

Gardiner P. W. 14
Garlock Machinery Ltd. 8
General Machinery Co. .....
General Hardwood Lumber Co. 31
Globe Vise & Truck Co. 119
Grand Rapids Vapor Kiln 112
Guelph Patent Cask. Co. Ltd. 87
Gulf Lumber & Trading Co. 41

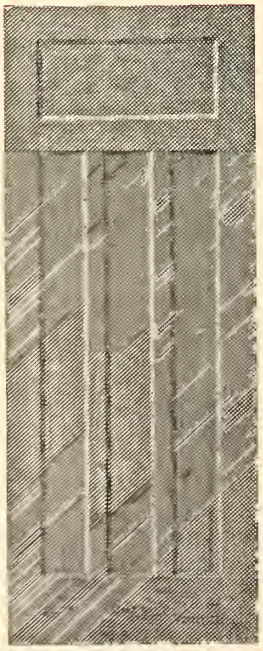
Hafner Mfg. Co. 48
Hamilton Gear & Machine Co. .....
Hartzell, Geo. W. 37
Hay & Co. 95
Hay & Co., Peter 103
Hawker Mfg. Co., W. S. 18
Heeney, Percy E. 32
Hoffman Bros., Co. 85
Hyde Lumber Co. 41

Ideal Fence & Spring Co. of Canada, Ltd. . 73
Industrial Engineering Co. 109

Jackson Cochrane & Co. 9

Kane Mfg. Co. 21
Kasebier Chatfield Shellac Co. 20
Kinnon Lumber Co., Ltd. 103
Klise Mfg. Co. 107
Klotz Machine Co. 24
Kosse, Shoe & Schleyer Co. 45
Kraetzer-Cured Lumber Co. 99

TRADE MARK



Design 37

A New Design of Clear Pine Door

Design 37, illustrated herewith has just been put on the market, and has already created a BIG DEMAND.

It is a beautiful door and is sure to become popular with the Trade.

Ask For Catalogue No. 7 recently issued covering

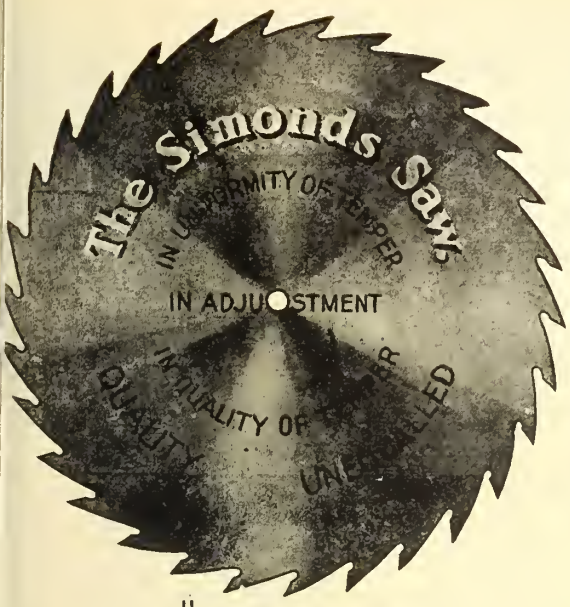
White Pine Doors **Chestnut Doors**
Veneered Doors **Sash, Columns and Mouldings**

(Please refer to this advertisement)

P. W. Gardiner & Son, Ltd.

Telephone 146

GALT - ONTARIO



SIMONDS
CIRCULAR AND BAND
SAWS

In every mill or woodworking shop in the land the demand for greater production is urgent. Devious methods to secure the desired results are being tried out. Some are making good—some are not. They have the manpower, but they can't get production. Many mills and woodworking shops have discovered one of the greatest hindrances to efficient operation are poor saws and knives. The saws dull easily and do not hold their tension, while the knives lose their cutting-edge quickly and this results in unsightly marks on the lumber, and consequently damage.

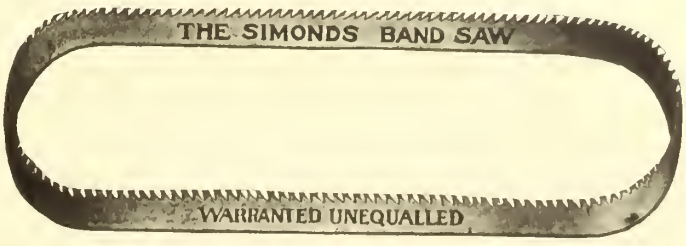
Inferior saws and knives are being discarded by many, and in most cases Simonds Products are replacing them. There is no question about Simonds Saws and Knives They are made of the finest steel obtainable, hardened and tempered right and make mechanically perfect. They produce smooth lumber and cut down your operating expense.

Write for catalog and prices.

Simonds Canada Saw Co., Limited

"The Saw Makers"

MONTREAL, Que.
VANCOUVER, B.C. ST. JOHN, N.B



Alphabetical List of Advertisers—Continued

Laidlaw Bale-Tie Co. 112
Larson & Shaw Ltd. 107
Litton Veneer Co. 84
Liverpool Hardwood Co., Inc. .....
Long-Knight Lumber Co. 95
Luehrmann Hardwood Lumber Company, Chas. F. 34

Marietta Paint & Color Co. 74
Mattison Machine Works 124
May Hardwood Co., R. R. 34
McDonagh Lumber Co. 39
McKenzie Machinery Co., D. 7
McKnight & Son Co., L. G. 122
McLennan Lumber Co., Limited 46
Memphis Bandmill Co. 35
Memphis Veneer & Lumber Co. 85
Mercereau Hawkins Tie Co. 32
Merritt Engineering & Sales Co. 17
Miller Lumber Co. .....
Mohawk Veneer Co. 84
Monite Glue 26
Morgan Machine Co. 121
Mowbray & Robinson 38
Munising Woodenware Co. 87
Murelle Lumber Co., L. D. 41

Nash, J. M. 122
National Dry Kiln Co. 13
National Hardware Co. 109
National Patent Reed Sales Co. 21
Nichols & Co., A. S. 79
Northwestern Cooperage & Lumber Co. .. 83

Oakey & Sons, John 27
Ober Manufacturing Co. 113
Ohio Veneer Co. 83
Oliver Machinery Co. 27
Oriental Textiles Co. 73
Otis Mfg. Co. 43
Overton, S. E. 119

Pedwell Hardwood Lumber Co. 30
Penrod-Jurden Co. 86
Penrod Walnut & Veneer Co. 86
Perkins Glue Co. 23
Petrie Ltd., H. W. 119
Pettingell Machine Co. 103
Pickrel Veneer Co. .....
Porter Machinery Co., C. O. .....
Preston Woodworking Mach. Co 10-11
Purcell Walnut Lumber Co., Frank 38

Radcliff Saw Mfg. Co. 123
Reese-Sheriff Lumber Co. 45
Reynolds Machine Co. 110
Richards Hardwood Co. 30
Richards-Wilcox Canadian Co. 103
Rush Lumber Co. 39

Shantz, P. E. 23
Shimer Cutter Head Co. 7
Shurley Dietrich Co. 19
Sidmons of Canada The 25
Simonds Canada Saw Co. 15
Smith Lumber Co., Payson 34
Smith, Sam D. .....
Sondheimer Co., E. 47
Standard Dry Kiln Co. 16
Standard Veneer Co. 85
Stark & Co., Jas. E. 39
Steels & Hibbard Lumber Co. 39
Stimson & Co., J. V. 40
Stimson Hardwood Co., J. V. 33
Stimson Veneer & Lumber Co. 33
St. Joseph Iron Works 19

Taylor Mfg. Co., Jas. L. 110
Thomas & Proetz 31
Toronto Veneer Co. 93
Toronto Hardwood Lumber Co. Ltd. 93
Turner-Farber-Love Co. 101

Vail Cooperage Co. 34
Valley City Machine Works 112
Van Atta & Co., E. B. 111
Veneer Manufacturers Co. 87

Waddell Mfg. Co. 107
Walter & Sons, J. 22
Watertown Table-Slide Co. 24
Wayne Lumber Co. 40
Willey Co., C. L. 91
Williams Machinery Co., A. R. 8
Williamson Veneer Co. 88
Wisconsin Veneer Co. 84
Wood Mosaic Co. 89
Wylie Mathew 8

Yates Machine Co., Ltd. P. B. 5
Yellow Poplar Lumber Co. 48
Young Lumber Co., Bedna 40

The Globe-Wernicke Co.

MAKERS OF

SECTIONAL BOOKCASES, FILING CABINETS IN WOOD AND STEEL, STATIONERS' SUPPLIES.

CINCINNATI

May 15, 1922.

The Standard Dry Kiln Co.,
Indianapolis, Ind.

Gentlemen:-

Feeling that you, like myself, or any other normal human being, would derive a certain amount of pleasure from a word of appreciation for an act or service well done, I thought it would not be amiss to express my appreciation of work well done by the battery of sixteen moist air compartment kilns installed by your Company for The Globe-Wernicke Company.

As the largest manufacturers of Office Furniture in the world we use almost every kind of lumber in commercial use from 5/8" to two inches thick, and as furniture stock is quite valuable our dry kilns have to meet the most exacting requirements.

This material, particularly where joints, mortises, laminations, glued construction, resawing, and shaping are involved, must not only be free from such defects as checks, splits, warp, etc., but must also be free from brittleness, case-hardening, and internal stresses, and dried to a uniform moisture content.

When your Mr. DeGroot was here a few days ago we took a trip through the great mill room. Of all the many kinds of lumber in operation, Ash, Basswood, Beech, Birch, Buckeye, Chestnut, Gum, Mahogany, Maple, Quartered Oak, Plain Oak, Poplar and Walnut we were unable to find one piece that was not perfectly kiln dried. We saw truck loads of gum, oak and poplar, which had been resawed and planed to 3/16 or 1/4 inch thick all lying perfectly flat and straight like so many pieces of metal.

We also had Mr. [redacted] of The Forest Products Laboratory of Madison, Wisconsin, with us this week. He complimented us highly on our drying and stated that we had the finest layout for efficiency that he had ever seen.

I am sending you a number of pieces of different kinds of lumber, cut and tested, showing uniform moisture content. Assuring you of my kindest regards, I am

Very respectfully yours,

THE GLOBE-WERNICKE CO.

W. B. Jones.

Results

Profit—satisfaction—freedom from worry, are what this letter shows in a plant whose quality product justifies your faith in their verdict.

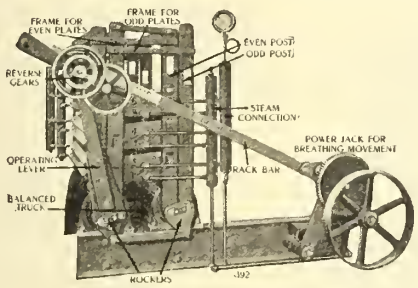
Would you like to know how they handle their drying?— Check your drying system against theirs—we will gladly send you our literature showing their layout, heating system, etc. Get on our free mailing list—Send your own and firm name to us at 1542 McCarty St., Indianapolis, Ind.

The Standard Dry Kiln Co.

MERRITT ENGINEERING AND SALES COMPANY LOCKPORT N.Y.

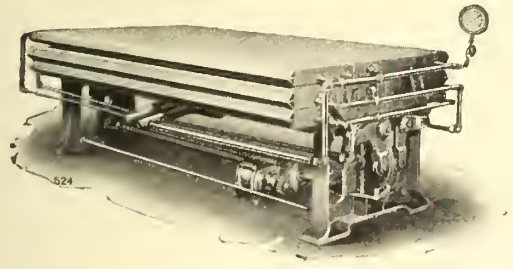
MESCO

It Pays to Install a "Merit" Re-drier



Bulletin No. 70-C.W.

Re-drying was not practiced to any extent 15 years ago when the "Merit" re-drier made its appearance on the market. Today very few glue rooms take a chance on veneer that has not been re-dried under hot plates and very few plants using veneer have neglected to install a "Merit" re-drier. This machine flattens the veneer and makes it absolutely bone dry. It takes very little steam and is operated by a 2 h.p. motor. It saves glue, simplifies taping and jointing and insures success in the finished product. It is made in several sizes of plate and starting with 4 plates, a machine can later be expanded to 12 or 16 plates.



The Three Plate Re-drier

The "Merit" Line

Veneer Lathes, Clippers, Driers and Re-driers

Plywood and Panel Machinery

Basket and Crate Machinery

MERIT

The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5.000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

Dominion Appraisal Company Limited

The Test of An Appraisal

"We have never been so grateful for anything we have done as for the appraisal made by you in December 1919. It certainly was worth thousands of dollars to us in the adjustment of the fire."

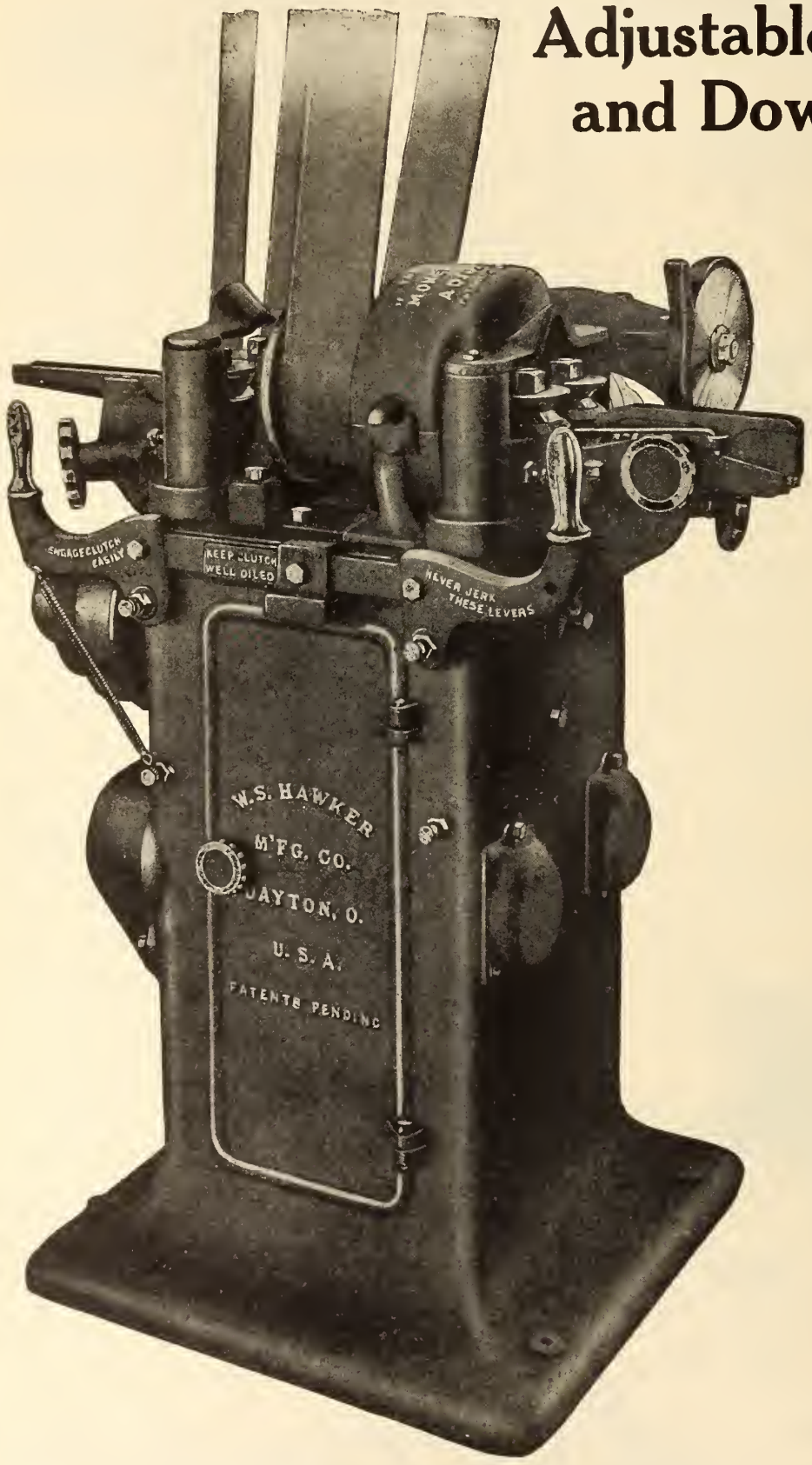
Port Arthur Daily News Limited
May 5th, 1921

Our staff of qualified appraisers—men with many years experience in the appraisal field—and our system of careful supervision of all work entrusted to our care has afforded protection to our large clientel extending throughout the Dominion of Canada.

We solicit your correspondence

8-10 Wellington Street East
TORONTO, ONT
Telephone Main 646.

The Money Maker—
Adjustable Rod and Dowel Machine



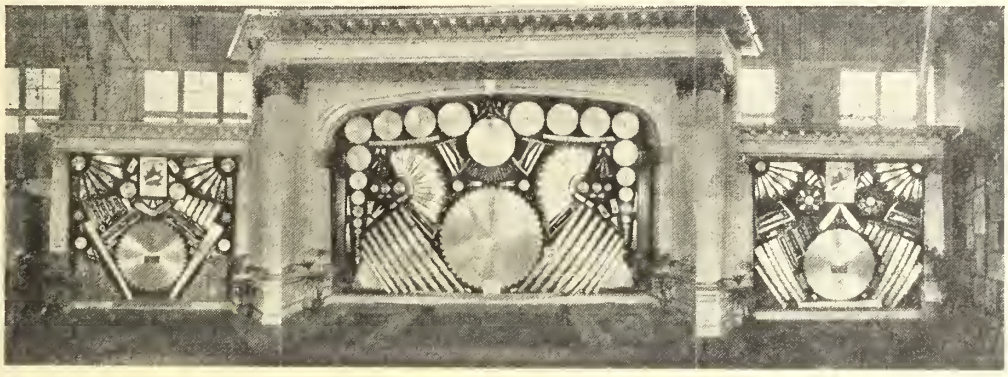
Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio

MAPLE LEAF SAWS



A Saw For Every Purpose

Used by all the principal Woodworking & Furniture Mfgs.

Throughout Canada

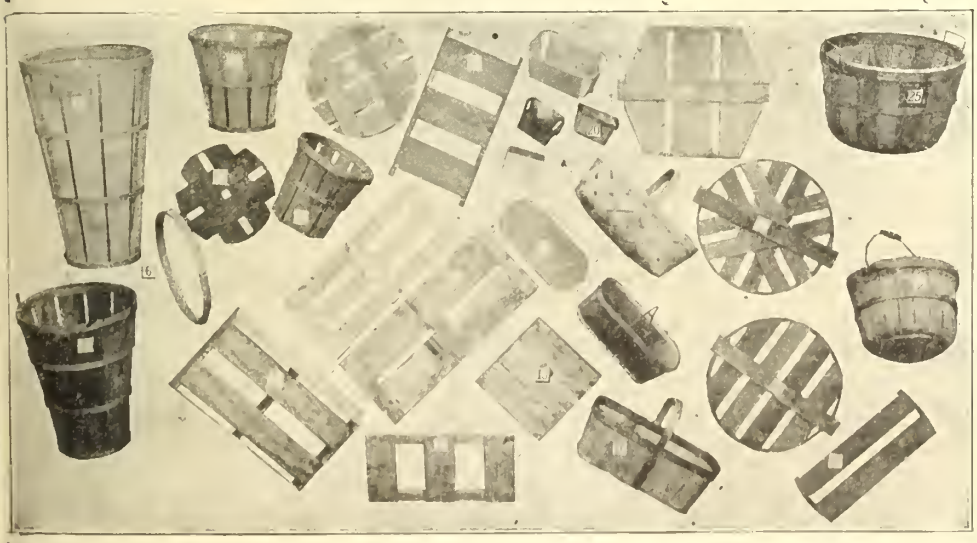
Cross-Cut Saws
Band Saws
Dado Heads

Special Saws
for
Special Work

Circular Saws
Hand Saws
Woodworking Cutters and Knives

Manufactured by
SHURLY-DIETRICH, LIMITED, The Largest all-Canadian Saw Manufacturers
GALT, Ontario

THIS IS THE NAME



of the Machinery for the Rapid Production of

Veneer—Crates—
Baskets—Fruit Packages.

"ST JOE"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

WATCH FOR THE BULL DOG

UNIFORMITY

When used in describing a **Cannon Glue** is more than a claim. It is an established **fact!**

We have customers in Canada who have used one brand for fifteen to twenty years without one cause for complaint.

CANNON CANADIAN CO., LTD.
TORONTO MONTREAL

To secure
Perfect White Shellac Varnish
it must be made from

Kasebier Quality Guaranteed
Kiln Dried Bleached
Shellac

KASEBIER-CHATFIELD SHELLAC CO. — KASEBIER QUALITY GUARANTEED — EST 1881 — BLEACHED SHELLAC — KASEBIER QUALITY HAS EARNED ITS REPUTATION. THIS LOT WAS MADE WITH THE DETERMINATION TO KEEP IT — NEW YORK, N.Y.

Insist that the White Shellac you buy is made from our Bleached Shellac

Kasebier-Chatfield Shellac Co.
No. 7 Cedar St., N. Y. C.

MADE WITH CASCO WATERPROOF GLUE PRODUCING A PRODUCT OF GREAT STRENGTH-PERMANENT AND IMPERVIOUS TO HEAT AND MOISTURE

The MARK of a New Standard in GLUE WORK

"CASCO"-MADE goods are worth more — IDENTIFY THEM.

Send for "CASCO" Red Book—a manual on Veneers, Panel-Making and Glue.

Samples of "CASCO" on request.

By request of numerous users of CASCO WATERPROOF GLUE we have designed the "Casco"-made seal illustrated which may be pasted on "Casco"-made products to identify them as superior articles.

We will be glad to furnish to all "CASCO" users as many of these seals as they may desire, or we will supply rubber stamps of the same design upon request.

Write us how many seals or rubber stamps you can use.

The Casein Manufacturing Company
Largest and Longest Established Manufacturers of Casein Products in America
15 PARK ROW, - NEW YORK CITY
Branch Offices in Principal Cities
HART & LEFEBER, LTD.
Canadian Distributors, 38 Grey Nun, Montreal

¶ The advertisements of the leading manufacturers will bring you into touch with trade conditions and the better qualities of engineering products.

Hugh C. MacLean Publications

Contract Record & Engineering Review, Electrical News, Western Canada Coal Review, Canada Lumberman & Woodworker, Western Lumberman, and also Canadian Woodworker & Furniture Manufacturer, Footwear in Canada and the Commercial. MacLean Building Reports give advance information on all building, engineering and construction in Canada.

TORONTO
MONTREAL
NEW YORK
LONDON

PUBLISHING HOUSE of HUGH C. MacLEAN

WINNIPEG
VANCOUVER
CHICAGO
ENGLAND

FIBRO-KANE
PATENTED
OPEN WEBBING

NATIONAL PATENT REED SALES COMPANY
DREXEL BUILDING
PHILADELPHIA, PA.

KANE VEGETABLE GLUE

Since the patent litigation has been decided in favour of the users of our glue, we have been extremely busy taking care of the trade, at a large saving in glue room costs over that of our competitor.

Quality and uniformity guaranteed.

KANE MANUFACTURING CO.

1832-34 South Clark Street CHICAGO, ILL.

Correct in Design

Reasonable in Price

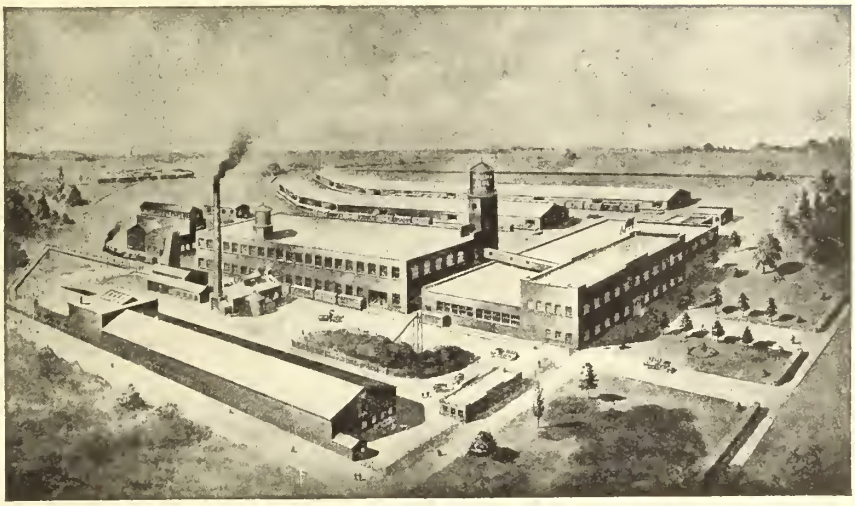
This, one of our many new designs, is half size. Until our new catalog is issued write in for your requirements. Give us a general idea of what you want, it may be among our many new patterns.

We are always ready and glad to work from your suggestions. Co-operation is the order of the day.

JOHN WALTER & SONS LIMITED

KITCHENER :-: ONTARIO

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.



General Office and Factory

SOMETHING YOU ALREADY KNOW

You are fully and permanently protected in adopting Perkins Glue

Our manufacturing process is the secret of the standard quality and uniformity of our product—the kind preferred by most manufacturers of Plywood construction. There are no comebacks where Perkins' Glue is used.

Patents covering Perkins Glue have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania.

Sales Office:
South Bend, Indiana.

Watertown Table-Slide Company

Watertown, Wisconsin U.S.A.

We have been making a specialty of table-slides for many years and our Roller-Bearing Equalizer Slide has been pronounced the best on the market. Full details and prices gladly forwarded.

Manufacturers of the famous Roller-Bearing Equalizer Slides.

What Does OPENKOTE Mean to You?

To the manufacturer who wants to secure maximum production and quality workmanship in his finishing department.

Paper means better, faster and cleaner work—and twice the output possible with the old type of finishing papers still in use. Behr's OPENKOTE produces results that gratify the heart of the most painstaking craftsman.

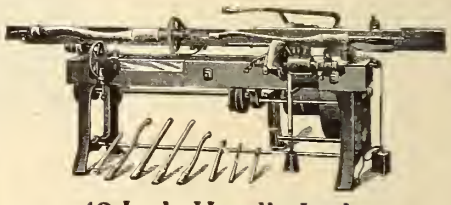
Working samples, for comparative tests on your own work, sent without charge. Please specify grades desired.

Herman Behr & Co., Inc.
31-63 Tiffany Place, Brooklyn, New York
Toronto: 361 Sorauren Ave.

1872 ***Pioneers in the Improvement of Sandpapers for 50 Years*** *1922*

Klotz Machine Co's Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.
We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

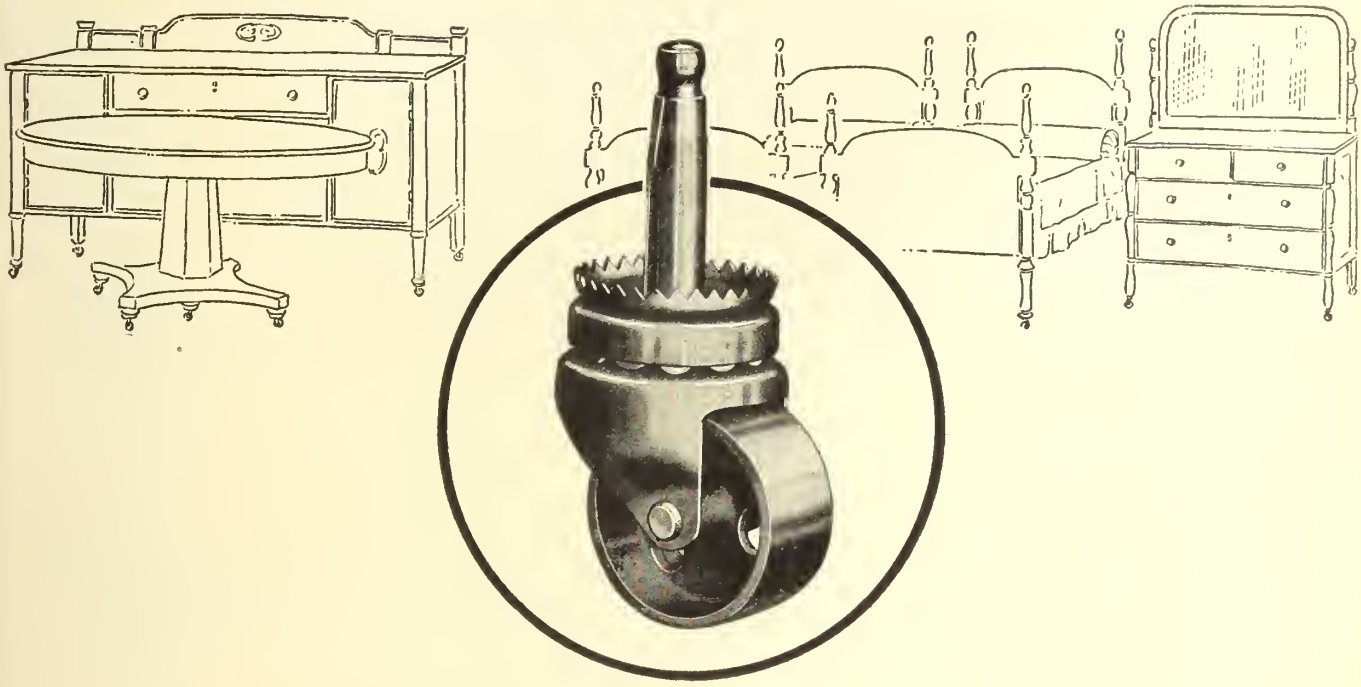
MANUFACTURED BY
Klotz Machine Co., Sandusky, O., U. S. A.
Write for descriptive circulars and prices.

FACTORY TRUCKS

Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY
P. E. SHANTZ, PRESTON, ONTARIO.

Factory Truck Style No. 26.



The Final Touch That Makes Perfection

The mirror on the dresser is flawless; it tilts at a touch.

The drawers of the buffet slide as if on graphite.

The finish of the table top shows weeks of patient labor.

The four post bed is sturdy through excellent selection of material.

They are all made perfect through attention to the important detail of casters.

It is such casters as **Efemco** that make furniture 100% right—that make it give absolute satisfaction throughout its entire life.

Send today for the **Efemco** *Caster catalog.*

Acme Grip Neck and Plate Casters
Acme Roller Bearing Casters
Atlas Plate Roller Bearing Casters

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

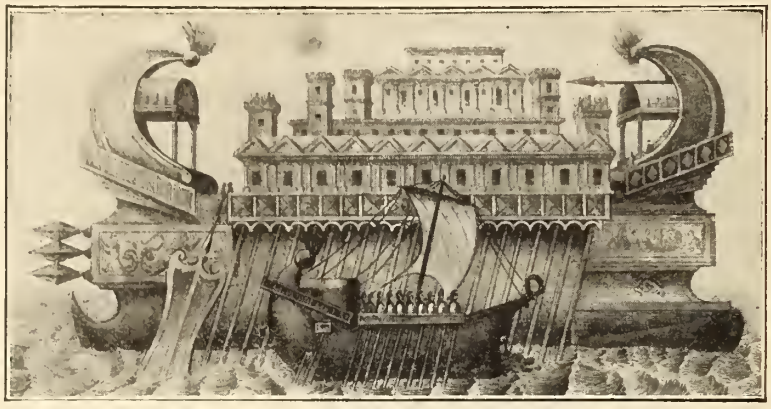
Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters

Roller Bearing Casters
Truck Casters
Automobile Accessories

Piston Rings
Grey Iron Castings

Standardized by 87 years of service.



The ancient Roman war-galley illustrated above was a floating fort with high wooden walls and towers. Trajan's famous ship was really a pleasure resort, a huge floating palace in Lake Nemi, fifteen miles from Rome. Most of it is still on the lake bottom—and no illustration seems to be available.

MONITE Waterproof Glue

The perfected modern form of casein waterproof glue, excels the glues of ancient Rome just as modern carpenter tools of tempered steel surpass the Roman woodworking tools of bronze and iron.

This Glue Held Under Water 18 Centuries!

The following quotation refers to the many-oared boat of the Roman Emperor Trajan, sunk about 100 A.D. in Lake Nemi and recently discovered.

> "I found the timber to consist of pine and cypress, in excellent preservation, which, besides a coating of black pitch, had a double covering of canvas glued on, and over it a sheet of lead fastened with brass nails."—Alberti V. XII fl. XXI.

Other Roman boats found today also show that the Romans master ship builders of antiquity, frequently used casein waterproof glue. Oak frames and pine or fir planking were fastened with copper or bronze fittings; nail heads were cemented over and the seams were calked with pitch, wax, lime, made from sea shells—or with flax. They covered the entire hull with a coating of pitch, a layer of canvas glued on with waterproof glue, and a sheathing of lead fastened with copper or brass nails.

Casein waterproof glue was also used by the Romans for furniture. The ruins of Pompeii have given up many marvelous samples of glue-joint and ply-wood work. Fabulous prices were once paid for rare and beautiful grained citrus-wood such as tiger, panther, wavy or peacock feather pattern. Cicero, the famous orator, paid $27,000 for one large block of citrus-wood; the Cethegi family paid $75,000 for one huge slab—to be used for ply-wood furniture. Much of this Roman furniture is practically like new today.

Monite Waterproof Glue, like the waterproof casein glue of the Romans, makes firm and permanent joints and ply-wood that will resist water, heat and climatic changes for centuries to come.

Ask us to mail you a small sample panel of ply-wood made with MONITE for you to test by boiling, soaking and baking. Write for the panel and our printed matter, NOW.

MONITE WATERPROOF GLUE CO.

MANUFACTURERS OF COLD GLUE IN POWDERED FORM

1628 N. 2nd Street MINNEAPOLIS, MINN.

Canadian Representatives:

W. H. CUNNINGHAM & HILL CO. LTD. - TORONTO, CANADA

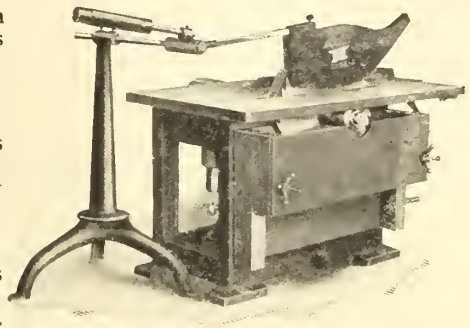
STOCKS AND REPRESENTATIVES IN ALL PRINCIPAL CITIES.

"OLIVER" SAW GUARDS

are made in various styles and sizes.

"Oliver" Guards for Jointers Shapers

Circular Safety Cylinders for Jointers Shapers Woodwokers .



OLIVER MACHINERY CO. GRAND RAPIDS, MICH. U.S.A.

American Hardwood Lumber Co.

St. Louis, Mo.

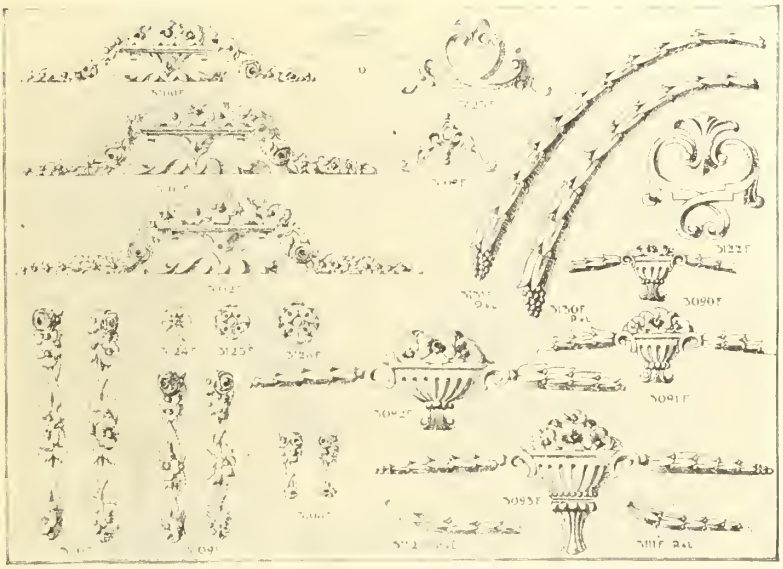
Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

PERIOD CARVINGS *for* FURNITURE

Largest Manufacturers of Imitation Wood Carvings in the World Quality the Best. Prompt Shipments



Unlimited Facilities for Manufacturing High Grade Wood Carvings in Composition and Wood Fibre

Reproductions of Exclusive Designs Our Specialty

THE DECORATORS SUPPLY CO.

2543 ARCHER AVENUE, CHICAGO

New Catalog Sent on Request

OAKEY'S

Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

JOHN OAKEY & SONS LTD.,

WELLINGTON EMERY AND BLACK LEAD MILLS
LONDON, S. E. 1.

Canadian Agents:

F. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Munson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

Making Selling

Hugh C. MacLean Publications

ANNOUNCING

A New Publication by a Famous House

We have pleasure in announcing that the "Canadian Furniture World" has recently been purchased by us and will be published at our head office: 349 Adelaide Street West, Toronto. Editorial and advertising policies will be made to conform with the following papers that have gained national prestige:

Electrical News, Canada Lumberman, Footwear in Canada, Canadian Woodworker, Western Contractor and Builder, Contract Record & Engineering Review, Commercial & Retail Merchants' Review, Furniture World, Western Lumberman, Western Coal Review.

Head Office: 345 West Adelaide Street

Vancouver Chicago Toronto Montreal Winnipeg

The largest publishers of technical papers in the British Empire, printing in Toronto, Winnipeg and Vancouver. Proprietors of MacLean Building Reports Limited.

A Better FINISH

You can improve the appearance and durability of your finishes and increase the saleability of your furniture by using

Cosmos High Grade Lacquers and Lacquer Enamels

Lacquer gives a permanent, waterproof surface that is tough and durable.

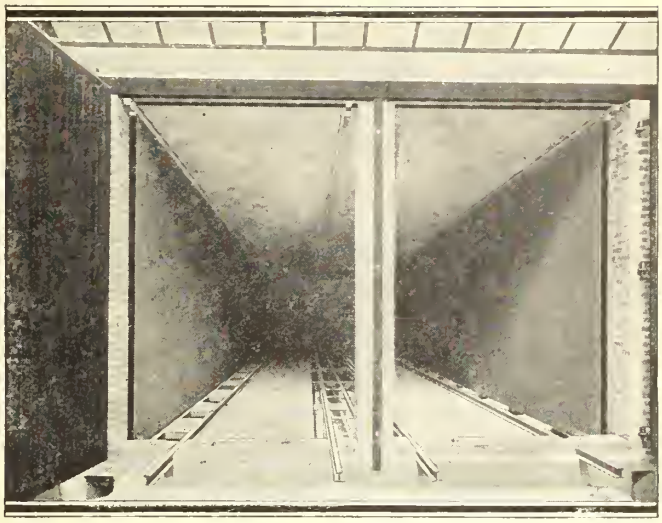
It dries rapidly, increasing the output of the finishing department. Successive coats may be applied at half-hour intervals, enabling work to be finished in one day.

Samples, prices and other particulars gladly furnished.

Our Specialties:

METAL LACQUERS
WOOD LACQUERS
ENAMELS
BRONZING LIQUIDS
EUREKA AIR BRUSHES
AMYL-ACETATE
REFINED FUSEL OIL
COLLODION
BRONZE POWDERS
MATCHLESS METAL POLISHES AND BUFFING COMPOSITIONS
BANANA OIL

Cosmos Chemical Company
Port Hope Ontario



Don't waste money patching old kilns

Modern kilns save money, dry in half the time and produce better quality. Cost very little more than patching.

LOWER costs, quicker deliveries, less delay on special orders will keep your mill going when competitors are shut down. But if your competitor dries in 5 days when you take 10; if his drying costs are 50% lower; if he eliminates all degrade due to Kiln drying, he will be getting your business.

The best patching won't make your old Kilns modern. New Kilns of old design won't save you. The new Cutler Kiln is what you need. 5 Cutler Kilns will have the same drying capacity as 10 of your old Kilns. The same moisture content you secure—10 days, can be had in 5 with a Cutler Kiln. Whenever this is done better quality is the result. The saving—degrade alone, will go along way toward paying for the installation. One of our customers is saving $500.00 per week for each 35 ft. Kiln.

Don't spend a dollar on your old equipment until you have heard our proposition. Write to-day for descriptive matter. Better still, let our Planing Engineer study your particular problem.

All essential features of the cutler kilns are fully protected by mechanical and process patents granted and pending.

CUTLER DESK COMPANY
Dept. F. Buffalo, N. Y.

Cutler
DRY KILN
Better Drying in half the time.

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVENUE : : TORONTO

Full or mixed cars for immediate delivery

HARD and SOFT MAPLE **ROCK and SOFT ELM**
BEECH **BIRCH** **and BASSWOOD**

Hardwoods in 4 x 4, 4 x 6, 1″ and 2″. No. 3 Common.

Why not get in touch with us?

H. J. RICHARDS J. T. KENDALL

Richards Hardwood Company

746-7 BANK OF COMMERCE BUILDING

Memphis, Tennessee, U. S. A.

Successors to Dacus-Richards Hardwood Co.

We make a specialty of catering to the Canadian trade and are in position to make reasonably prompt shipment of practically any Southern Hardwoods which you are needing. Your orders and inquiries will be highly appreciated and will receive our prompt and personal attention.

Specializing in Delta Red and Sapgum, Oak, Elm and Poplar.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

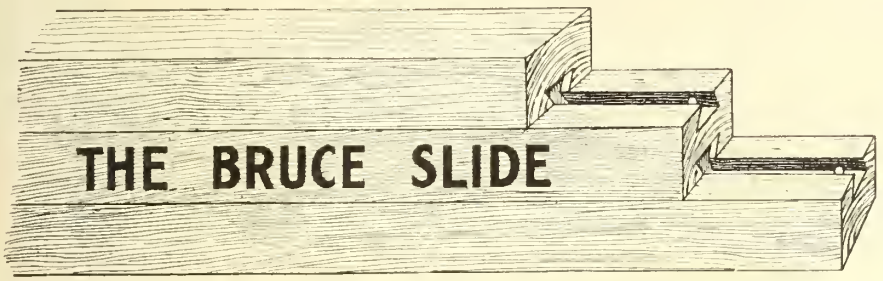
Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

TABLE SLIDES TABLE RIMS TABLE PINS



Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont

Thomas & Proetz Lumber Co.

3406 Hall St.
ST. LOUIS, MO.

MANUFACTURERS of OAK AND GUM

As well as all other Southern Hardwoods

LET US HAVE YOUR INQUIRIES

BELZONI, MISS. —— MILLS —— CALION, ARK.

GENERAL HARDWOOD LUMBER COMPANY

SOUTHERN AND NORTHERN HARDWOODS
118 North La Salle Street
CHICAGO

Quick shipments assured, together with quality stocks.
Kindly favor us with your enquiries.

Mercereau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

FOR IMMEDIATE SHIPMENT

10 cars 4/4 No. 2 C & B. Birch
4 cars 5/4 No. 1 C & B. Birch
5 cars 6/4 No. 1 C & B. Birch
7 cars 8/4 No. 1 C & B. Birch
2 cars 10/4 No.1 C & B. Birch
3 cars 12/4 No. 1 C. & B. Birch
3 cars 16/4 No. 1 C & B. Birch
4 cars 8/4 No. 2 & No. 3 Com. Birch
20,000 ft. 4/4, 5/4, 6/4, mostly 4/4 and 5/4 Canadian Cherry No. 1 C & B. 6/14 inches wide.
40,000 ft. 4/4 No. 1 C & B. Basswood
30,000 ft. 6/4 FAS. Maple, very choice stock
400,000 ft. 1 x 3 and up Spruce Crating
200,000 ft. 2 x 3 and up Spruce Crating
400,000 ft. 5/8 x 3 and up Spruce Crating

Write, Wire or Phone Inquiries

PERCY E. HEENEY

Office: 298 Breithaupt St., KITCHENER, ONT.

IN SPITE OF THE FLOOD WATER

We are still manufacturing as usual and shipping promptly

Chapman & Dewey Lumber Company

Mills
Marked Tree, Ark.

940-950 Bank of Commerce Bldg.
MEMPHIS, TENN.

Branch Office
Kansas City, Mo.

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" Fas.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

QUARTERED RED OAK
- 5 cars 4/4" Fas.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.

QUARTERED RED GUM
- 5 cars 4/4" Fas.
- 2 cars 4/4" Fas. Fig.
- 2 cars 5/4" Fas.
- 2 cars 6/4" Fas.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM S.N.D.
- 5 cars 5/4" No. 1 Com. & Btr.
- 5 cars 6/4" No. 1 Com. & Btr.
- 10 cars 8/4" No. 1 Com. & Btr.

ASH
- 4 cars 10/4" No. 1 Com. & Btr.
- 1 car 12/4" No. 1 Com. & Btr.
- 1 car 6/4" No. 1 Com. & Btr.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.
- 1 car 5/4" No. 1 Com. & Btr.

SAP GUM
- 10 cars 4/4" Fas.
- 3 cars 5/4" Fas.
- 3 cars 6/4" Fas.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 5 5/4" No. 1 Common.
- 5 cars 6/4 No. 1 Common.

PLAIN RED OAK
- 2 cars 4/4" Fas.
- 3 cars 5/4" Fas.
- 3 cars 6/4" Fas.
- 2 8/4" Fas.
- 10 cars 4/4" No. 1 Common.
- 5 cars 5/4" No. 1 Common.
- 5 cars 6/4" No. 1 Common.

PLAIN WHITE OAK
- 4 cars 4/4" No. Com. & Sel.

COTTONWOOD
- 2 cars 4/4" Fas.
- 10 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

ASH
OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

DRY STOCK

For Immediate Shipment

	SOFT ELM	
6905′	1″	—No. 1 C&B
3195′	1″	—No. 2 Com.
41030′	1½″	—No. 1 C&B
2356′	1½″	—No. 2 Com.
56880′	2″	—No. 1 C&B
10046′	2″	—No. 2 Com.
110594′	2½″	—No. 1 C&B
26985′	2½″	—No. 2 Com.
11750′	3″	—No. 2 Com.
	WHITE ASH	
87846′	2″	—No. 1 C&B
3072′	2″	—No. 2 Com.
139960′	2½″	—No. 1 C&B
13537′	2½″	—No. 2 Com.
18992′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.
	HICKORY	
650′	1″	—No. 1 C&B
1408′	2″	—No. 1 C&B
	COTTONWOOD	
1620′	1″	—No. 1 C&B
19956′	2″	—No. 1 C&B
1196′	2″	—No. 2 Com.
	BLACK WALNUT	
2873′	1″	—No. 1 C&B
1151′	1″	—No. 2 Com.
	WILLOW	
1446′	1″	—No. 1 C&B
	CHERRY	
4747′	1″	—No. 1 C&B
2137′	1″	—No. 2 Com.
	ROCK ELM	
12493′	2″	—No. 1 C&B
	SOFT MAPLE	
14397′	2½″	—No. 1 C&B
	BASSWOOD	
1549′	1″	—No. 1 C&B
606′	2″	—No. 1 C&B
	BUTTERNUT	
2584′	1″	—No. 1 C&B
	HARD MAPLE	
31788′	1″	—No. 1 C&B
243927′	1¼″	—No. 1 C&B
227707′	1½″	—No. 1 C&B
1796′	1½″	—No. 2 Com.
217401′	2″	—No. 1 C&B
11410′	2″	—No. 2 Com.
38016′	2½″	—No. 1 C&B
11091′	3″	—No. 1 C&B
2796′	4″	—No. 1 C&B
	BEECH	
3000′	1½″	—No. 2 Com.
500′	2″	—Log run
250′	2½″	—Log run
350′	3″	—Log Run
100′	4″	—Log run
	BIRCH	
15998′	1″	—No. 1 C&B
22311′	1¼″	—No. 1 C&B
11748′	1½″	—No. 1 C&B
50157′	2″	—No. 1 C&B
87172′	2½″	—No. 1 C&B
7866′	3″	—No. 1 C&B
	PLAIN OAK	
9369′	1″	—No. 1 C&B
1107′	2″	—No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

If it is Hardwoods, and you can Drive a nail in it, we have it in straight or mixed carloads.

We want orders for

4/4 No. 1 Common Poplar

6/4 No. 1 Common Walnut

8/4 No. 1 Common Walnut

Quick Shipment

R. R. May Hardwood Co.

1522 S. Sixth St Louisville, K.Y.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Ply Wood Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Southern Hardwoods

GUM - POPLAR - OAK

We take a just pride in turning out the very best lumber for the manufacture of high grade furniture.

A modern mill, experienced operators and rigid grading of the finished lumber is your guarantee of assured satisfaction.

Test Our Service

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY Memphis - Tennessee SERVICE

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. **GREENFIELD, OHIO**

It Stands Out Above the Average

The general consensus of opinion is that Iowa-grown Walnut possesses a shade better grain and marking on the average than other Walnuts.

Selected Iowa-grown logs, cut with extreme care to preserve the inherent beauty make IOWA WALNUT. You owe it to yourself to investigate before you buy. Write or wire to-day for quotations.

IOWA WALNUT

Lumber and Veneers

—grown on Iowa corn land

DES MOINES SAWMILL CO., S. W. 10th and Murphy Streets, Des Moines, Iowa.

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

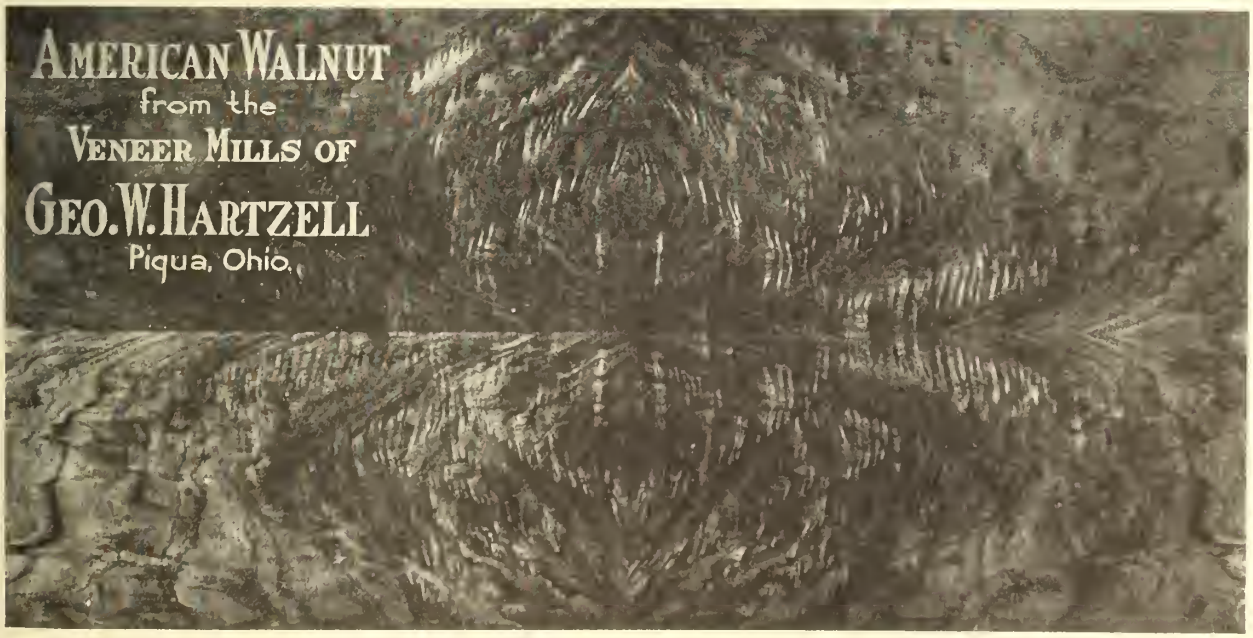
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manu facture.

Oak Timbers and Planking

The Mowbray & Robinson Co.
(INCORPORATED)
Manufacturers
Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative:
A. K. Johnson, Traders Bank Building, Toronto, Ont

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE
Kansas City - Kansas

ELM MAPLE

FOR SALE RUSH LUMBER COMPANY FOR SALE

GUM OAK

ASH POPLAR

QTD. WHITE OAK			
4-4	F. A. S.	2,000′	
4-4	F. A. S. 10″ & up	1,000′	
4-4	No. 1 Com.	15,000′	
4-4	No. 2 Com.	15,000′	
5-4	F. A. S.	14,000′	
5-4	No. 1 Com.	8,000′	
5-4	No. 2 Com.	4,000′	
6-4	No. 1 Com.	30,000′	
6-4	No. 2 Com.	20,000′	
8-4	F. A. S.	5,000′	
8-4	No. 1 Com.	3,000′	
PLAIN WHITE OAK			
4-4	No. 1 Com.	5,000′	
4-4	No. 2 Com	8,000′	

4-4	Sound Wormy .	25,000′	
4-4	No. 3 Com.	70,000′	
5-4	F. A. S.	2,000′	
5-4	No. 2 Com.	13,000′	
6-4	No. 1 Com.	2,000′	
PLAIN RED OAK			
3-4	No. 1 & 2 Com.	70,000′	
4-4	F. A. S.	2,000′	
4-4	No. 1 Com.	10,000′	
4-4	No. 2 Com.	20,000′	
5-4	F. A. S.	7,000′	
5-4	No. 1 Com.	15,000′	
5-4	No. 2 Com.	3,000′	
QTD. RED GUM			
4-4	F. A. S.	7,000′	

4-4	No. 1 Com.	13,000′	
5-4	F. A. S.	2,000′	
6-4	F. A. S.	3,000′	
6-4	No. 1 Com.	14,000′	
RED GUM S. N. D.			
8-4	No. 1 C&B. ...	70,000′	
10-4	No. 1 C&B. ...	40,000′	
SAP GUM			
5-8	No. 2 Com.	7,000′	
5-4	F. A. S.	1,000′	
5-4	F.A.S. 13″ & Up	4,000′	
5-4	No. 1 Com.	9,000′	
6-4	F. A. S.	11,000′	
6-4	No. 1 Com.	6,000′	
6-4	No. 2 Com.	4,000′	

POPLAR			
4-4	No. 2 A Com. ..	25,000′	
4-4	No. 2 B Com. ..	35,000′	
5-4	Sel. & Bet.	9,000′	
5-4	Saps	3,000′	
5-4	No. 1 Com.	12,000′	
5-4	No. 2 A Com. ..	8,000′	
6-4	Sel. & Bet.	7,000′	
6-4	No. 2 Com.	12,000′	
8-4	Sel.	3,500′	
8-4	Sap	8,000′	
8-4	No. 1 Com.	3,000′	
MISCELLANEOUS			
4-4	L. R. Qtd. B. Gum	25,000′	
4-4	L. R. Pln. B. Gum	25,000′	

MEMPHIS, TENN.

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

Sawed Veneer

Quartered White Oak

For Furniture and Panels

Plain Red Oak

For Interior Trim and Doors

Cypress

For Battery Separators

Manufacturing Uniformly Good. Quality Unsurpassed

James E. Stark & Co., Inc.

MEMPHIS, TENN.

McDonagh Lumber Co.

203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods

Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

Calhoun Plywood Company

Panels Tops Counter Fronts

OPERA CHAIRS
in the White or finished.

Vegetable or Waterproof Glue.

Sheboygan - Wisconsin

WAYNE LUMBER CO.

Manufacturers and Wholesalers

American and Canadian
Hardwoods

Birch and Maple—Our Specialty

Special items we want to move:
BIRCH 50,000′ 1″ No. 1 C & B
60,000′ 2½″ No. 1 C & B
40,000′ 3″ No. 1 C & B
MAPLE 2 carloads 2″ No. 1 C & No. 2 C
1 carload 1¼″ No. 2 Com.
SOFT ELM 70,000′ 1″ log run
70,000′ 2″ log run
BASSWOOD 1 carload 2″ log run

110 West 40th St. New York

Canadian Representative,
D. Cote, 871A Durocher St. Outremont, Montreal

BEDNA YOUNG
Lumber Company

Jackson - Tennessee

Manufacturer of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for
High Grade Lumber
please let us have your enquiries.

HARDWOOD LUMBER

'A Quality you will admire"

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Kiln Dried Products

Our kiln at Owensboro is a thoroughly modern equipment for handling green or dry lumber with efficiency and entire satisfaction.

Our facilities enable us to give real service—straight or mixed carloads.

Try our soft textured and finely figured quartered-sawn red and white oak. It will please you.

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills Owensboro; Campbellsville, Kentucky

DIMENSION

We are just starting the operation of a mill in Mississippi cutting.

Oak Bending Material

such as Automobile Bows, Wagon Rims, Sleigh Runners, Chair Posts, etc. We claim there is no better Bending Oak than we have at this mill. Let us have your inquiries and submit you samples.

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN
Office Dimension Mill & Yard
Belt Line at McLean.
MEMPHIS - TENN.

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated

General Office, NEW ORLEANS, U.S.A

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn
Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

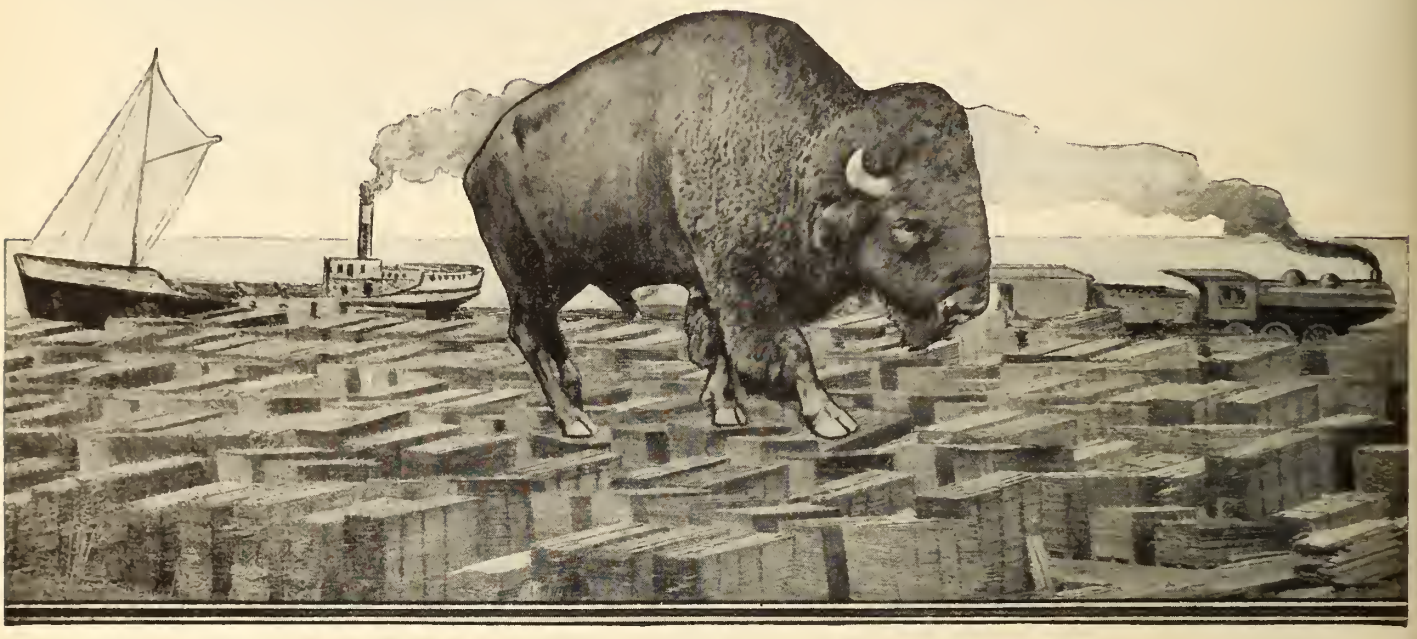
General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

A few Specials :
130,000 ft. 4/4" No. 1 and No. 2 Common Qtrd. White Oak
65,000 ft 4/4" No. 1 and No. 2 Common Plain White Oak
100,000 ft. 4/4" No. 1 and No. 2 Common Poplar

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Buffalo for Hardwoods



"LET BUFFALO DO IT"

Buy and Sell Your Hardwoods in Buffalo

Do you want prompt shipment? We can give you service. Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.

Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

Frank T. Sullivan
Specialities:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
Northern Grey Elm
and
Brown Ash
Niagara Street Cornor Arthur

ATLANTIC LUMBER COMPANY
HARDWOODS
West Virginia Soft Red and White Oak
Our Speciality: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller, Sturm & Miller
1142 Seneca Street
Hardwoods of All Kinds

YEAGER LUMBER CO., Inc.
SPECIALITIES
Oak, Poplar, Ash, Maple
932 Elk Street.

STANDARD HARDWOOD LUMBER COMPANY
HARDWOODS
Prompt Shipment { From Buffalo Yards or from mill direct to you
8 Million Feet Dry Stock on hand
1333 Clinton St.

G. Elias & BRO., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and fir timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B WALL Pres. T. H. WALL Vice-Pr.
M. M. WALL, Treasurer
940 SENECA ST.
We Specialize in White Ash, Oak, Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

HUGH McLEAN LUMBER CO.
Hardwoods of all Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

TAYLOR & CRATE
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut
1100 Seneca Street

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

AMERICAN BLACK WALNUT

LUMBER **VENEERS**

OUR SPECIALTY

We are prepared to furnish straight or mixed cars, all grades 3/8″ to 4″ in thickness.

BAND MILL IN DAILY OPERATION

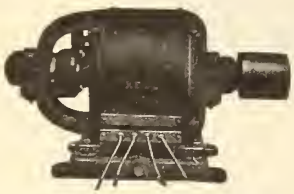
....Various items in Quartered White and Red Oak and Cherry.

1/28″. SLICED. WALNUT VENEER especially selected for quality wood and color.

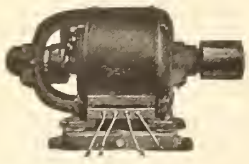
The Kosse, Shoe and Schleyer Co.

Lock Box No. 18 St. Bernard, Cincinnati, Ohio.

Agents in all Furniture Centres.
Offices: Baltimore, Md., Jamestown, N.Y. and Grand Rapids, Mich.
Represented in Chicago, Rockford, Ill., Detroit, Kitchener, Ont., Canada, New York City and San Francisco.



Is it economical



Is it the right type

Is it the right size

THREE GUESSES

Electric power, heating, lighting and equipment problems are to be found in the lumbering and woodworking industries.

Perhaps your output can be increased? You are, perhaps, losing electrical energy by wasteful types of motors? Are your switches and wiring devices up-to-date or are you in continual danger of fire?

We shall be pleased to answer any questions or help you with any problems whenever you care to write us.

Electrical News

Engineering Contracting — Merchandising Transportation

The National Authority

Toronto, 349 West Adelaide Street; Winnipeg, Travellers' Building; Vancouver, Winch Building.

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods
White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

Subscribers' Information Form

Many letters reach us from subscribers enquiring where certain goods can be obtained. We can usually supply the information. We want to be of service to our subscribers in this way, and we desire to encourage requests for such information. Make use of this form for the purpose.

Date.....19

"CANADIAN WOODWORKER"
345 Adelaide St., West, Toronto

Please tell us where we can secure (give description as fully as possible) .....

.....

.....

.....

Name .....

Address .....

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut Mahogany, Teak, Oak Ash, Cypress

ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

The McLennan Lumber Co.

Limited

MONTREAL

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co. Limited

ORILLIA ONTARIO

Sawmills at Zebra and Orillia, Ont.

Cable Address: "Special," Orillia, Can.

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

1 in.—58,000
1¼ in.— 3,500
1½ in.—

CHERRY

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
1 in.	44,500	.....	203,900	18,500
1¼ in	4,900	.....	37,600	7,500
1½ in.	2,000	.....	34,700	36,300
2 in.	6,000	.....	22,200	61,900
2½ in.	5,500	.....	4,300	2,200
3 in.	25,700	.....	6,500	3,300
4 in.	4,000	.....	900	400

CHESTNUT

	1 & 2	Clear Strips.	No. 1 Com.	S.W. & No. 2 Com.
¾ in.	500	.....	56,000	91,000
1 in.	11,000	500	45,000	1,000
1¼ in.	66,800	300	100,200	159,200
1½ in.	34,500	.....	40,000	.....
2 in.	2,200	.....	15,300	89,200
2½ in.	4,000	.....	1,500	.....
3 in.	1,100	.....	1,000	500
4 in.	1,500	.....	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
½ in.	6,500	.....	.....	.....
¾ in.	900	300	23,600	9,000
⅝ in.	2,800	.....	5,500	800
1 in.	17,300	10,000	52,400	27,000
1¼ in.	5,000	.....	6,000	.....
1½ in.	600	.....	2,400	.....
2 in.	.....	.....	25,100	5,700
2½ in.	2,000	.....	400	.....
3 in.	2,000	.....	1,300	.....
4 in.	2,500	.....	1,700	.....

PLAIN WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	1,000	.....	.....	.....
½ in.	100	.....	.....	.....
⅝ in.	2,150	.....	8,000	16,900
¾ in.	274,800	.....	453,800	122,000
1 in.	42,300	1,700	78,000	85,200
1¼ in.	6,300	.....	15,100	.....
1½ in.	51,300	.....	84,000	12,000
2 in.	29,000	.....	125,000	54,000
2½ in.	152,800	.....	69,500	3,000
3 in.	55,800	.....	75,800	14,400
3½ in.	4,500	.....	4,000	1,500
4 in.	65,000	.....	38,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	24,200	.....	.....	.....
¾ in.	170,000	.....	327,000	65,800
⅝ in.	2,400	.....	77,000	42,600
1 in.	30,200	3,150	56,000	125,400
1¼ in.	11,700	2,400	16,600	.....
1½ in.	138,900	4,300	46,200	32,000
2 in.	91,500	.....	162,000	71,000
2½ in.	70,100	.....	26,000	3,700
3 in.	23,800	.....	20,500	7,000
4 in.	16,600	.....	10,900	.....

QUARTERED RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
¾ in.	1,700	.....	9,700	500
1 in.	10,200	5,400	7,500	1,400
1¼ in.	2,000	.....	.....	.....
1½ in.	.....	.....	.....	.....
2 in.	.....	.....	7,400	.....

SAP GUM

	1 & 2	Strips.	No. 1 Com.	No. 2 Com.
1 in.	.....	16,000	21,000	.....
1¼ in.	.....	.....	.....	.....
1½ in.	.....	2,400	6,000	13,500
2 in.	.....	.....	5,700	10,400
2½ in.	.....	.....	.....	.....

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	20,000	9,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

	No. 1	No. 2
1 in.	16,300	10,900	9,500
1¼ in.	6'000	8,325	.....
1½ in.	12,000	13,300	9,500
2 in.	9,000	3,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	2,000	6,000	7,000
5/4	9,400	10,800	.....
6/4	8,900	5,500	4,600
8/4	1,300	19,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No.2 Com.
⅝ in.	18,000	15,800	31,300	800
1 in.	27,000	5,200	91,900	.....
1¼ in.	22,300	360	5,700	6,000
1½ in.	19,100	13,000	29,000	7,500
2 in.	15,000	.....	10,500	24,500
2½ in.	10,800	6,000	.....	.....
3 in.	17,900	.....	11,400	47,000
4 in.	6,500	.....	300	450

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft..... ..3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft.....8/4 No. 1 Com

Band-mills at Baton Rouge, La., Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.
BAY CITY - - MICHIGAN

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

Mills: Coal Grove, Ohio

General Offices: 33 Rector St. New York City

Ash Poplar Cypress

HAFNER

MANUFACTURING COMPANY

1 Car	1 x 6 " Fas.	2 Car	4/4" Sel.	1 Car	1 x 6" No. 1 Com.
1 "	1 x 8 " Fas.	1 "	5/4" Sel.	2 "	1 x 8" No. 1 Com.
1 "	1 x 10" Fas.	3 "	6/4" Sel.	2 "	1 x 10" No. 1 Com.
1 "	1 x 12" Fas.	1 "	8/4" Sel.	1 "	1 x 12" No. 1 Com.
3 "	4/4" Random Width Fas.	½ "	10/4" Sel.	10 "	4/4" Ran. Width No. 1 C.
2 "	5/4" Random Width Fas.	1 "	1 x 8" No. 1 Shop.	5 "	1 x 6" No 2 Com.
2 "	6/4" Random Width Fas.	5 "	4/4" Ran. Width No. 1 S.	4 "	1 x 8" No. 2 Com.
1 "	8/4" Random Width Fas.	1 "	5/4" Ran. Width No. 1 S.	1 "	1 x 10" No. 2 Com.
½ "	10/4" Random Width Fas.	1 "	6/4" Ran. Width No. 1 S.	2 "	1 x 12" No. 2 Com.
½ "	12/4" Random Width Fas.	1 "	8/4" Ran. Width No. 1 S.	300 M.	1 x 6-8-10-12" Peck.
				100 M.	2 x 4-6-8-10-12" Peck.

Thoroughly dry ready for immediate shipment in mixed cars if you desire

ST. LOUIS, MO., U.S.A.

E S T A B L I S H E D 1 8 7 1

Oak Red Gum

Why Bruce Hardwoods Excel

For many years before we became hardwood lumber manufacturers, we were makers of fine Oak Flooring and are to-day the largest individual producers of that material.

The producing of good Oak Flooring is an exacting science—where perfection is attained—and teaches the value of both skilful grading of raw material and accuracy in milling.

With a full appreciation of the value of these factors, we entered also upon the manufacture of southern hardwoods and in the operation of this department, have applied them in the production of all items in white and red oak, gum, ash and other species.

With our joint facilities, we are equipped to ship square edge parquetry strips, oak trim and mouldings, as well as Oak Flooring in the same car with hardwood lumber.

Inquiry and correspondence invited.

E. L. BRUCE COMPANY
MANUFACTURERS
MEMPHIS, TENN.

Band Mill: LITTLE ROCK
Oak Flooring Plants: MEMPHIS; LITTLE ROCK

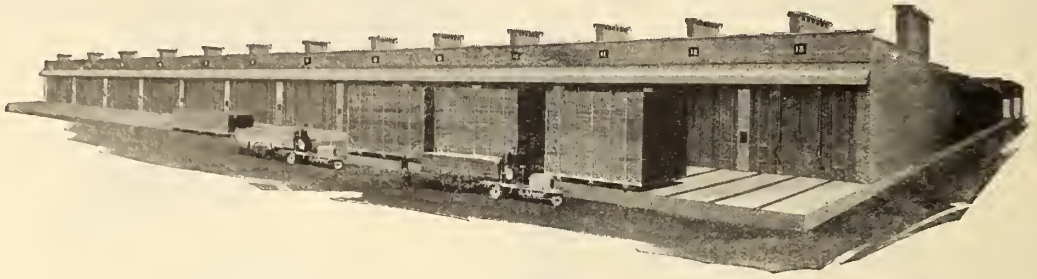
Walnut
Oak
Poplar
Chestnut
Gum
Ash

Will Ship High Class Stock and Make Prompt Shipment.

Leland G. Banning
Cincinnati, Ohio

Canadian Representative:
A. E. Klippert, 11 Laxton Ave
Toronto

KILN DRIED HARDWOODS



Kiln capacity 3,000,000 ft. monthly

WEST VIRGINIA
OAK
CHESTNUT
WHITEWOOD
BIRCH
HICKORY

We earnestly solicit your inquiries

AROMATIC RED CEDAR

ARKANSAS
RED GUM
SAP GUM
OAK
ASH
ELM

The M. B. Farrin Lumber Co.

CINCINNATI, OHIO

Dependable Shippers of American Hardwoods

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars

All Canadian and American Hardwoods

Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - - TORONTO
Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.
Subscription, $2.00 a year; foreign, $2.50.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 Toronto, June, 1922 No. 6

Is Price-Cutting Justifiable?

Such articles as "Is it Profitable to Sell at a Loss?" and "The Facts Behind the Cost Figures," which have appeared in recent issues of the "Canadian Woodworker and Furniture Manufacturer," have been read, judging from comment made, with a considerable amount of interest. While not advocating price-cutting in any shape or form when the sole object is to secure business in the face of keen competition or to undersell the other fellow at any cost and show him that others can cut as low as he can, there are times when it is not only reasonable and commendable to sell at or even below cost but when it is absolutely necessary to do so in order to secure a sufficient volume of work to hold an organization together, reduce overhead and in various ways lessen what would otherwise be a larger loss. This is the situation in some woodworking plants to-day.

In the furniture field the manufacturers of certain lines of furniture are none to busy. The same may be said of the operators of general woodworking plants catering particularly to special order work. The activity in the residential building field has resulted in a strong demand for various kinds of stock millwork, but very few builders, either private or speculative, are showing any desire to pay for special work. This means that certain furniture manufacturers and certain other woodworkers are finding it decidedly quiet at the present time. What can they do to stimulate sales or to prevent serious losses being incurred?

It has often been intimated that as a rule woodworkers are inclined to substitute price-cutting for salesmanship. There are many things a manufacturer can and should do to stimulate sales before he resorts to the blue pencil, but, on the other hand it cannot be denied that price is a factor to be reckoned with. Almost anything can be sold at any time provided the price is made sufficiently attractive. If it is considered advisable to make any reductions they should be made on an intelligent basis, that is, with a full knowledge of costs and all cost factors, and with a definite object in view.

One woodworking concern has adopted a plan along the idea outlined in the article in the April "Canadian Woodworker" entitled "Is it Profitable to Sell at a Loss?" By taking the orders on file and checking them with cost data covering similar work, the number of hours of work ahead of each department was ascertained. This information was put in chart form and the chart kept up to date. If, for instance, the chart shows that the door department has not sufficient work ahead, a determined effort is then made to land some orders. If inquiries for doors are received the prices are made unusually attractive, and, in addition, contractors and others putting up buildings, are interviewed and a strong effort made to land the door business, at least. The same procedure is followed when other departments are faced with a slack period. Working ahead in this manner, it is necessary to wait until a department becomes slack before work is sought, but as soon as the chart indicates that any department is rapidly cleaning up the work on order, steps are taken to secure more work for such departments. The intensity of the effort and the price concessions made are determined entirely by the urgency of the situation as indicated by the chart.

Back of all this there should be a persistent, determined effort to bring down the cost of all work to as low a point as possible. Waste, that is waste material, waste labor and misdirected effort should be sought out and eliminated. Various lines of new equipment should be investigated, and if a saving can be made with a new machine, there should be no hesitancy about purchasing it, as it will quickly pay for itself. New methods and new ideas should also be carefully analyzed with particular reference to their application to your requirements. In this connection the industrial engineer is beginning to play an increasingly important part in the woodworking field. Through the aid of industrial engineers costs are being reduced and the productiveness of workmen and departments increased. One large Canadian manufacturer, producing a varied line of furniture, recently engaged the services of an industrial engineering organization which specializes in the woodworking field. The cost records of this concern show that as a result of the work done, the costs of certain sticker operations were reduced 59%, 43% and 34% respectively and other important savings effected. This is merely a suggestion of what can be accomplished if gone about in the proper manner.

Will Radio Craze Affect Phonograph Sales?

Drop in Phonograph Sales has Alarmed Many—Will This New Competition Assume Formidable Proportions?—What Past Experience has Demonstrated

In the phonograph field both the manufacturer and retailer are wondering just what affect the widespread interest which is being evinced in wireless receiving sets will have on their particular business. Is this to be considered a competitive line? Will the strong consumer demand for wireless sets result in a decreased sale of phonographs? The question is an interesting one, especially so as there is something to be said on both sides.

There is little doubt that in the first enthusiastic rush for wireless receiving apparatus, the phonograph industry will suffer. The attention of many people will be centered on wireless rather than on phonographs, with the result that record sales and exchange sales will show a decline. Further it is only to be expected that some who were on the verge of investing in a phonograph, will defer the purchase of that instrument in favor of a wireless set. This is only natural, for people are being carried away by their enthusiasm for this new and wonderful instrument, but this is only an initial and passing phase.

Advantages with Phonograph

The real test will come when the first enthusiastic rush for that which is undoubtedly novel and interesting is over, and the public have had a chance to allow their reason and judgment to come into play. At first thought it is nice to be able to "tune in" on the air and catch distant concerts and music of various kinds. The first time I "listened in" I experienced a distinct thrill. The idea of picking up music out of the air was almost unbelievable. After the first few evenings, however, the drawbacks and annoyances of this form of home entertainment gradually became apparent. First and foremost it is out of the question to select and choose; one has to be content to take what comes over or switch off. Again, the receiving apparatus may not be working properly or there may be a lot of "interference" in the air, with the result that the music is weak and indistinct. Another drawback, and a real one, is that we cannot "tune in" at any minute of the day or night and pick up something good.

For these reasons alone it is not unreasonable to suppose that the phonograph will be able to continue to hold its own. One can start this instrument at any time one wishes. There is an almost unlimited range of records, covering music in all its forms, from which to select, and favored selections may be repeated time and time again. There is another phase, however, which will tend to maintain the popularity of the phonograph in the face of any kind of competition, and that is the permanency of the records and of the master records from which the composition records are reproduced. Caruso can never be heard over the wireless, but with the phonograph one can hear him at leisure. The same holds true of other departed stars. In this particular direction the phonograph is supreme.

Taking Counsel from the Past

Some years ago, and not so many at that, when the demand for phonographs was increasing by leaps and bounds, the makers of pianos began to feel alarmed, but, upon second thoughts and a closer analysis of the situation, they realized that anything which tended to educate the public to music or that tended to increase the popularity of music, could not help but result in an increased demand for pianos. Time has proved the correctness of this conclusion for in spite of the fact that phonographs have been sold by the hundreds of thousands, the production of pianos has been increased and a ready market found for all that have been made. The same will undoubtedly hold true of wireless. If it tends to arouse a greater interest in music, it will, probably, result in an increased sale for both phonographs and pianos.

This is the attitude taken by Ralph Freeman of the Victor Talking Machine Co., who said recently,—"The radio broadcasting of music is a useful and a very wonderful thing and it is working for us all the time—by creating a love for music. There is a mistaken idea that the radiophone is a competitor of musical instruments. It is not so. Rather does it go hand in hand with our business. There are wonderful possibilities in the radiophone field but it will not break into that of musical instruments."

To Promote "Furniture Weeks"

At a meeting of the directors of the Home Furnishings Bureau held in Toronto recently, it was decided to make a small assessment on the members for the purpose of promoting a number of special furniture weeks in various centres. A general meeting of the Bureau is scheduled for Wednesday June 14th when plans for the next twelve months will be formulated.

A detailed outline of the results of the special Furniture Week held recently at Windsor, Ont., was presented by Mr. Blogg, who pointed out that the furniture made by the members of the Bureau was featured all during the week, with the result that the membership secured some good business. Those present stated that they had received many nice orders as a result of this "furniture week," and considered that a series of displays of this kind during the fall months would act as a stimulant on the fall trade.

A vast amount of good can be accomplished at a comparatively small outlay through the promotion of special weeks of this kind and in other ways bringing furniture prominently before the buying public. As a whole the furniture industry stands to benefit from the activities of the Bureau, this work should receive the support of the industry as a unit instead of a limited number of furniture manufacturers standing all the expense as at present.

The American Homes Bureau are endeavoring to promote a National Furniture Week some time in October. The scheme is to have furniture featured in every city, town and hamlet in every state of the Union. There is no doubt that if this idea can be put across it would result in arousing a greater amount of interest in furniture and the furnishing of the home. This national scheme presents a goal at which the Home Furnishings Bureau of the Canadian Manufacturers might well aim.

Making Furniture on Gravity Conveyors

How a Progressive Manufacturer Has Organized His Plant—Handling Costs Reduced with Gravity Conveyors — Work Thoroughly Systematized—Eliminating Confusion and Costly Delays

Multiple production! The term is familiar to everybody, yet it only became prominent in the English language a few years ago. Perhaps it was born when Henry Ford applied the rule of multiplication to those fast little "Lizzies" that dot the globe in every clime. Perhaps the date was earlier, but, anyway, we have with us today, "Multiple Production," and it is going to stay with us for a long, long time.

That little manufacturer, with the big vision and the yearning look—ask him what he is longing for, and he will answer, "Multiple Production." That big fellow, whose plant covers acres and whose checkbook is bigger still—let him whisper in your ear the cause of all his prosperity, and don't be surprised when he tells you, "Multiple Production."

It is in the air. It has invaded and pervaded every industry, and the aromatic red cedar chests that are useful as well as ornamental adjuncts of our homes are now the result of multiple production.

Planned for a Purpose

A salient example is found in the plant of the Standard Red Cedar Chest Company located at Altavista, Va. It is a new factory, not yet a year old, and it was planned with (and for) a purpose. The builders did not simply erect a structure and then occupy it. They first gave careful thought to the character of the work to be produced and how it could be produced most advantageously, and with this as a basis the factory was consummated. In other words, they laid out their processes and then erected a building around them.

It is interesting to witness the real science of production, the science that obtains lower manufacturing costs, a better product, maximum production in minimum space, and an extraordinarily satisfactory service to customers.

In the Altavista plant the lumber is first sawed and then scientifically treated in dry kilns. Perhaps the term "drying" is anomalous, for it is the mission of the kiln to provide sufficient moisture to prevent the boards from cracking, and to retain the proper amount of oil in the lumber to supply the odor necessary for moth prevention. So, you see, a dry kiln is not wholly a dry kiln; it is an institution that scientifically treats woods.

Conveyor Belts Take Hold

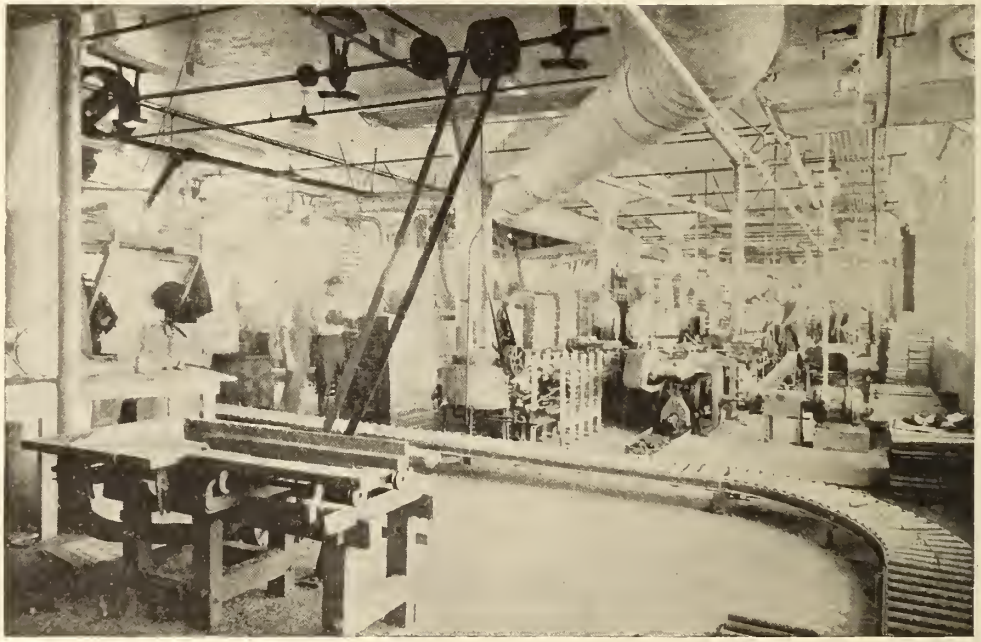
From the kiln the lumber is delivered to the machine department, where it is cut to the necessary lengths and freed from all defects. It falls on a belt conveyor that at this particular juncture moves toward the grading department where skilled "pickers" sort out the panels, selecting those that can be used to the best advantage.

And then another machine comes into action. Machines and more machines till the last step is reached, because it is not expedient, according to multiple production, for any man to do what a machine can do.

From the time the red cedar lumber enters the door until the finished chest is delivered to the packing room, machines are glutted with work, via the belt conveyor. No trucks are used for handling the panels.

Well, from the grading department the panels roll through the dove-tail glue jointer, which makes a joint that is stronger than the natural wood itself, as proved by tests. Onward they go to be dressed, sanded and trimmed, and the tenoner gives them a sharp welcome and a cutting goodbye. It is the tenoner that makes the famous double-lock corner which

Conveyor trucks and racks are employed in the finishing room to handle the work.



View in machine department showing line of gravity conveyors

The chests are assembled on conveyors, and as in the Ford plant each man performs certain operations as the boxes move along.

enables the workmen to assemble sides and ends without nails or screws, obtaining a joint that is air-tight and dust-proof.

The mention of workmen in the last sentence is really an error, for the sides and ends are assembled by machinery. Apparently the workmen just look on and collect their pay checks every week, but as a matter of fact the assembling machine does a better job than human hands could ever accomplish. The joint is tighter and when the bottoms are put on in the same way, the tiniest particle of dust or the most persistent moth could never find a crevice for entrance.

What was formerly lumber and panels now begin to look like chests, and they slide down a gravity conveyor by the sides of which men are stationed at intervals. Each man does his particular piece of work on the chest with speed and precision, and he is a specialist at his task, constant and intensive application to one line of labor giving him the highest skill possible. In this way the maximum amount of production is obtained with a minimum amount of effort.

All operations in the Standard plant are tested by that increasingly popular invention, the time-study watch. This instrument gives the duration of any process to the fraction of a second, and permits the manufacturers to determine the best and speediest method of doing the work, for multiple production demands speed.

Conveyor Trucks in Finishing Room

In the finishing department the chests are handled on skids with lift trucks, and by this method more speed is obtained because ten or a dozen chests can be manipulated where only one could possibly be handled in the old way.

The varnish is applied by spraying systems which give a better and more uniform finish, and this finish is rendered a high degree of permanent beauty by means of a specially constructed kiln which dries the varnish scientifically.

Now the chest is finished, and it goes to the packing department. Here, too, the ever-present conveyor is a willing server, carrying the work to the men who, like in the cabinet department, stand at the sides and perform their particular tasks speedily. Throughout the plant everything is moved by belt conveyor, gravity conveyor or lift trucks—nothing is allowed to touch the floor or to stop. The path is laid out for the material and it has to keep moving quickly. Even when the chest is packed and crated a gravity conveyor delivers it to a tram car which carries it to the warehouse.

Every Assistance to Dealers

Such, in brief, is the story of multiple production in a plant making cedar chests. Every operation, from cutting the standing trees of red cedar to the delivery of the finished product, is controlled by the manufacturers, and the machinery is of the highest type, insuring the best quality of workmanship at the lowest cost.

But the service rendered to retail dealers does not end there. Multiple production is naturally dependent upon distribution. Things that are made must be sold or the factory chokes itself with surplus stock, and so the manufacturers provide the dealers with efficient sales helps, such as electrotypes and matrices for newspaper advertisements, and for window displays attractively colored show-cards, cedar-logs, shavings and other stage accessories that will aid in making an eye-compelling window.

Thus every step of the way—from the cedar groves to MiLady's boudoir—the keen insight and foresight of multiple production is obvious.—"Furniture Index."

Bending Southern Oak Chair Posts in Hot-Plate Bender

Effect of Length of Steaming Period—Tension Failures and Their Prevention—Summary of Studies Made

By W. K. Loughborough

(Continued from May issue)

There seems to be a definite relationship between the length of the steaming period and the amount of surface checking resulting from the bending process. This is because the steaming alters the moisture content. If stock contains little moisture, invariably more surface checks follow the longer steaming periods than the shorter ones. If the fibers are saturated with moisture, varying steaming periods have no effect upon surface checking. In order that surface checks may be prevented, the steaming period should be no longer than is necessary to produce the required degree of plasticity.

The proportion of rejections from surface checking becomes greater with an increase in the moisture content and in the severity of the drying conditions, that is, the steam pressure used in the bending plates. Bending and drying material that contain 40 per cent of moisture between plates heated by 55 pounds of steam pressure is sure to result in a total loss.

There is a decided tendency for the stock that has a high moisture content to fail in tension with the longer steaming periods. As the tension failures start in the plane of medullary rays, which is also the plane of surface checking, an increasing tendency of the stock to surface check when the quarter-sawed faces come in contact with hot plates will produce an apparent increase in the number of pieces that fail in tension. A surface check on the side (and near the lower side) of the post usually passes through the surface brought in tension. If the tension stress of bending is added to planes already weakened by shrinkage stress, the chances that the stock will fail in tension are increased in proportion to the increase in the tendency of the stock to shrink.

As would be expected, surface checking in chair

*Assistant Engineer, Forest Products Laboratory Maidson, Wis.

posts increases as the temperature between the plates increases. Generally speaking, the steam pressure in the hot-plate benders should be as low as the production requirements will permit. It should never exceed 20 pounds. Other conditions being the same, there appears to be no marked difference in the number of rejections for any cause whether 5 or 20 pounds of steam is carried in the plates. However, a pressure of 55 pounds results in a large loss upon surface checking even if the moisture content of the stock does not exceed 15 per cent.

It is the custom to bend chair parts so that the quarter sawed surfaces will be in the positions of the most prominence in the finished product. Usually, as with an oak back post, the figured surface is brought in contact with the hot bending plate. If for any reason it is bent the other way, that is, with the tangential face up, the surface of the material checks much worse than if it is bent in the usual way. Compression failures also are more common in bending oak posts if their tangential surfaces are brought in contact with the hot plates than if their radial surfaces receive the maximum heat.

Trouble from Compression Failure

This increase in compression failures seems to occur as the result of an increased amount of surface checking. It is evident that in the southern oak the plane of the medullary ray is weak; whatever failure occurs during the bending and drying processes occurs in that plane. The tangential face surface checks in the plane of the rays as the wood dries. It appears that the surface tension, due to drying in the hot plate bender, in conjunction with the stress due to bending, must strain the medullary ray to the point of rupture, thus producing lateral folds. This rupture of the lateral folds would appear as compression failure if the material were deformed by a stress applied at right angles to the annual rings. If the rupture occurs in material deformed by a force acting in the direction of the tangent of the annual rings, it may appear as tension failure, as already mentioned. It seems to be quite evident that the surface tension caused by drying does increase the stresses. If the tangential surfaces are placed in contact with the hot plate, the maximum surface tension is obtained. The three factors influencing surface checking are brought into action at once; a rapidly drying surface having the largest shrinkage potential is subjected to the most severe drying conditions.

If quarter-sawed material is bent with the quarter-sawed face in contact with the plates, the reverse is true; the drying conditions surrounding the tangential face are much milder, because the temperature is cooler; and, as no opening is left between the pieces, the humidity tends to become higher. It seems that the pieces whose annual rings cross the cross section diagonally dry with the least surface checking, and, in fact, make the best looking posts, as all four surfaces show a good figure. The natural tendency of such posts to diamond is prevented by the plates.

Preventing Tension Failures

Although wood fibers can be squeezed together more than the ordinary chair post bend demands without damaging results, the amount of stretch which wood will endure is very limited. It is important to prevent tension stress as much as possible. It was found that loss from tension failures can be controlled and practically prevented by applying before and maintaining during the bending processes sufficient compression on the ends of the pieces to prevent the convex surfaces from becoming stretched. The factor of end pressure is probably the biggest factor influencing tension failures. Within practical limits, the losses from tension failure were inversely as the pressure applied. This was true regardless of any other factor.

Because of the importance of compression stress parallel to grain it is evident that all posts in any one plate should be exactly the same length, for this makes it possible to apply the proper stress to each post. In general, the best results are obtained when enough pressure is applied to put a slight reverse camber into the post before bending. It is important that the pressure be distributed evenly over the entire end surfaces of the post; otherwise there is a decided tendency to shear at the ends. A simple way of obtaining an adequate amount of pressure is to drive wedges between the iron tenplates riveted onto the straps which hold the material and a strip of stout material placed at the ends of the post.

The time for the tests was so brief that it was necessary to limit the study to one class of material—white and red southern oak—and to one form of bend. By watching the operations in the bending room an idea was obtained of how other woods and forms bend. Rock elm gives the least trouble under the most severe bends. Mahogany, birch, and gum have a tendency to fail in compression in the order given. None of the ring porous woods seemed to fail in compression if they were bent with the radial surface against the plates. Even the walnut post did no fail in compression. Gum warped more than the other woods in the plate bender; but this trouble was overcome by wedging in the strap against lateral deflection before the plates were closed. All species seemed to surface check somewhat, but oak checked the worst. So far as noted, maple seemed to surface check the least. Tension failures did not seem to be more prevalent in one species than in another. However, it was impossible to isolate the factor of species to determine this point absolutely.

Bending Characteristics of Different Species

In bending the quarter sawed oak pieces about 1 inch thick and from 5 to 8 inches wide, it was noted that compression as well as tension failures occurred. The compression failure produces a wash board appearance across the surface. These failures were not noted in the bending of the narrower oak parts, such as rockers and chair posts, even though the amount of deformation was practically the same. Superficial observations indicate that compression failures occur in the plane of the medullary rays, regardless of the way the oak is turned in the plates. It also seems evident that the tensile strength of the fibers across the pain is a constant factor, but that the stress required to deform wood varies directly as the width. Consequently the wider or deeper the piece bent the more chance there is for failure in compression. It seems impossible to apply the end pressure so as to distribute the stress evenly. Consequently the wood fails at the weakest first, then gradually clear across the width of the piece.

Summary of Conclusions

1. If 1 by 2 inch southern oak chair posts are to be bent in a hot plate bender, the center of the stock

(Continued on page 94)

Grinding and Jointing Planer Knives

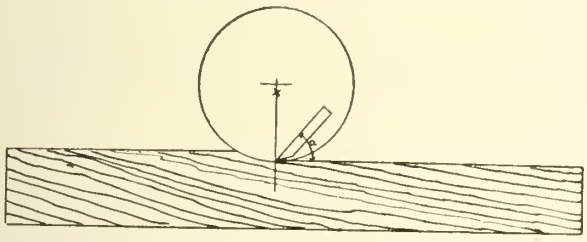
Time and Steel Both Conserved by Grinding on Head—Proper Cutting Angle and Heel Clearance—Jointing Brings all Knives into Cutting Circle Though This May be Accomplished by Grinding Knives on Head

By A. P. Redden*

There is room for considerable improvement in the knife grinding and jointing methods as followed in many plants. The old laborious and inaccurate method of removing the knives from the heads, grinding them and then tediously setting them in line with the bed is rapidly passing into disfavor and is being replaced by modern grinding-on-head and jointing practices.

The angle or bevel on the knife itself is of prime importance and often makes the difference between poor and satisfactory work. The accompanying sketch shows the usual method of measuring the knife angle. "X" is a perpendicular passing through the centre of the cylinder, "A" is the angle of cut. The edge of the knife coincides with the points of intersection of the perpendicular and the stock.

The proper angle of cut depends upon the kind of stock being planed, also the quality and quantity of work required. Softwood and quick work from



Showing how angle of cut is ascertained

38 to 45 degrees. Hardwood and fine work from 80 to 85 degrees. This will not rip any cross grained stock. An angle of 65 to 70 degrees has been found to give the best universal results. The different angles of cut are generally obtained by back grinding, however the manufacturers of cylindrical heads are making heads with the knives set at a greater angle than formerly and back grinding is not necessary.

Proper Bevel for Planer Knives

The amount of heel clearance used is something that is generally carried to excess. The heel of the knife should have a very small clearance. If knives are ground with a long bevel, the edges will be thin and weak, very easily nicked and will also chatter in the cut, and if set with a short overhang are sure to crack.

Many planer men drift into the habit of long bevels to avoid grinding. Taking off, grinding and resetting knives requires a lot of time, and if they can whet and file them a couple of times more think they are saving time. This is a mistaken idea, the thin edge will not stand up and knives and time are both wasted.

The advent of electricity into the factory and mill has brought many valuable devices, including motor grinding devices for grinding the knives in their place. This is fast becoming a universal practice. With this method the knives can be ground with just the proper clearance, and when dull can be reground in less time than is usually spent in whetting. Knives should never be ground with the periphery of a small wheel, this makes the edge too thin when the heel clearance is right.

Why Knives Should be Ground on Head

It has been proven beyond a doubt that knives ground in place will last three times as long as those taken off for grinding. In the Weber Piano Factory, Worcester, Mass., a set of high speed steel knives lasted three years by this method whereas a set taken off for grinding, (doing the same work lasted less than one year.

Every time a knife is bolted onto a grinding machine the knife is sprung by the drag of the bolts, and when reset on the head the same thing takes place. Grinding in place is acknowledged by nearly all to be the proper method. The qualifications for a grinder should be:

First—Easily transported from one machine to another.

Second—Quickly set up and taken down.

Third—Grind a nearly flat surface, just slightly concaved, giving a strong edge.

Fourth—Grind each knife on the same head the same length and grind true to the bed without adjustment each time.

Fifth—Grind quickly and without burning the edge of the knife, this can be accomplished only by a certain pressure on the wheel which has been pre-determined and cannot be changed.

Hints on Jointing Cutter Knives

Jointing knives while the head is in motion is quite widely practiced. A head running at high speed has a throw caused by imperfect balancing It may be in perfect standing balance, yet be out a lot when running. A jointer corrects this but when the cutters have been jointed they should be ground to an edge before using, Of course, this must be done with the knives in place.

Many large manufacturers of pianos and furniture have found by grinding the knives on the head, jointing is not necessary. The jointer may be used largely with the old method of grinding, but is used now only where the finest mircrometer planing is necessary or the improved methods of grinding have not been adopted. The real reason for jointing is to have every knife doing its share of the cutting. If this can be accomplished by grinding on the head and it can if the knives are ground so as to leave a silver edge or in other words a slight streak of bright metal showing, there is nothing to be gained by jointing.

*Stockbridge Machine Co., Worcester, Mass.

Boring 7,200 Holes an Hour

How Savings are Being Effected with Multiple Spindle Boring and Mortising Equipment—Machines Pay for Themselves in Quick Order—Experience of an American Furniture Manufacturer

In the production of furniture and other forms of woodwork the boring of holes and the making of mortises are two important operations. In the past this work has been done largely on single spindle machines, but in response to the demand for more efficient methods and for ways and means of reducing costs, the manufacturers of boring and mortising equipment have developed multiple spindle machines which not only enable more work to be put through in a given time, but the work is done with a degree of accuracy not usually encountered with single spindle equipment.

From actual experience it has been found that where any considerable volume of production is handled, multiple spindle machines are able to show a marked economy in the saving of time required for the boring and mortising operations. A further saving is also made in the assembling operations where special fitting is often required because of inaccuracies in the boring or mortising. A gang machine when set up for any particular job will turn out parts which correspond in every way, regardless of the number put through and so has an important bearing on assembling costs.

Handling Time the Same

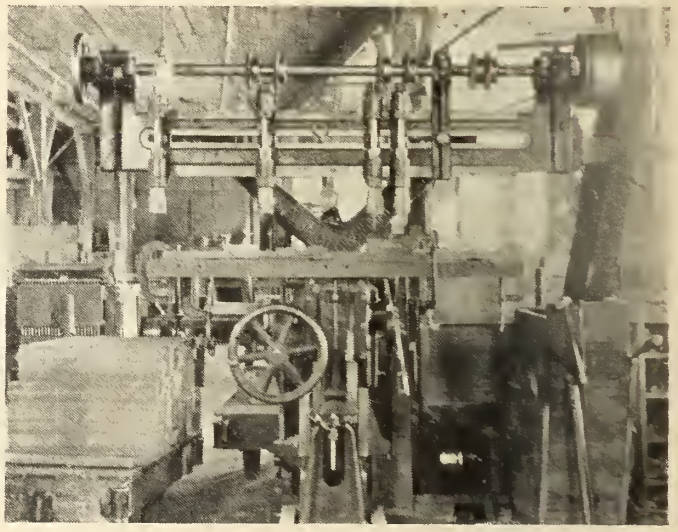
The handling time required to place a piece on the table of a single or multiple spindle machine is the same, and as much time is required to bore one hole on a single spindle machine as to bore from two to twenty holes on a multiple spindle borer. With the single spindle machine when a number of holes of the same size are to be made in a piece, an elaborate set of stops must be provided to locate the material in the different positions so that the holes come in the right places, and in the event that the holes are staggered, this stop system is still further complicated. In many types of gang boring machines the spindles may be so spread and adjusted that the holes can be bored over a wide area either in straight lines or in irregular positions without in any way affecting the handling or retarding the production of the machine. Another point to consider is that where various sized holes are to be bored in the same piece, the proper sizes of bits can be placed in the different spindles of the gang-boring machine, and all the holes made at once, whereas with a single borer only one sized hole can be bored in a piece at one handling unless the machine is stopped and the bit changed.

Rates of Feed Carried

The two types of machines usually differ with regard to the feed. This is particularly true of boring equipment. With the single spindle borer the bit is usually fed into the wood either by hand or with the aid of a foot lever. In either case the operator does not have free movement for quick action in handling the material. On the other hand with the multiple spindle machine the output is limited only by the speed at which the man can get the pieces to the machine and away from it between the boring strokes which are automatic.

The rate of feed usually carried on the modern multiple spindle machine usually runs from 10 to 22 strokes a minute, depending particularly on the size and shape of the piece handled as this affects the speed with which the operator may pick up and lay down the stock.. In any event the rate should be so set that the machine will set the pace for the operator and so that he will have to devote close attention to his work to keep up with the machine. On very light work faster feeding rates are possible in some cases running as high as from 35 to 40 strokes a minute with one piece being bored at each stroke. However, these latter rates of feed are the exceptions rather than the rule, but from 15 to 20 pieces per minute can be considered as a fair average speed.

In furniture work the multiple spindle boring machine is usually made to bore in one direction although there is a tendency toward equipment which will bore in two or more directions at the same time. Boring machines are also available which will bore both straight and angle holes in the same general direction. In this connection it might not be out of place to mention that small cluster spindle heads are often used for boring groups of holes with close centres. These can be used on either single or multiple spindle machines, but where there are a number of groups of holes to handle, the multiple spindle equipment is to be preferred, for not only can the different groups be bored at the one operation, but the spacing between the groups is always accurate and uniform.



A Fay & Egan multiple spindle boring machine in plant of the Office Specialty Mfg. Co., Limited, Newmarket, Ont.

While it is out of the question to lay down any hard and fast rules as the conditions under which the boring is done in each plant varies, it may be taken as a basis for analysis that any plant handling any volume of work in which two or more holes appear in the same piece can profitably use multiple boring equipment. Even in some of the simpler forms of work

requiring only two or three holes, a machine of this kind often saves its full cost the first year.

Pays for Itself Quickly

An instance of this kind is the case of a woodworking concern which spent $1,300.00 for a multiple spindle borer and found that it paid for itself seven times over during the first year. Another instance of this kind is where a manufacturer had a large boring job, 55,000 pieces, and figured that the multiple spindle machine he installed to handle this work saved its cost five times over on this one job alone.

Multiple spindle mortising does not present equal possibilities in cost reduction and increased production as multiple spindle boring machines although when mortise and tenon construction is used on designs where several mortises of equal length appear on the same face of the stock, the multiple spindle mortiser can be used economically and with the same advantage as the gang boring machine, both with regard to time saved in the handling of work to the production of the machine and to the perfect duplication of the work. Where the length of mortise does not exceed the width by more than 50 per cent. it is possible to use an oblong chisel and complete the mortise in one stroke. For mortises of greater length as compared with the width, it is necessary to form them by making repeated strokes and moving the work along between each downward movement of the chisels.

Experience of One Manufacturer

The Furnas Office Furniture Co. of Indianapolis, Ind., who are using both multiple spindle boring and mortising equipment, have found this idea to be a money-saver. They have this to say,—"It would appear as if each manufacturer of woodwork can figure out for himself as to whether or not the multiple spindle idea can be used on his work. It is a very simple matter to decide. First figure the actual labor cost of running the entire job on the basis of boring or mortising one hole at a time, then figure the actual labor cost on the entire job by using multiple spindle mortiser or boring machine and making as many holes as possible at one time. If the difference in cost is large enough to pay the purchase price of a multiple spindle machine and, in addition, effect a substantial saving, obviously it is the part of wisdom to buy such a machine. Whenever possible it seems better to use a power feed machine having a known rate of feed so that it is easy to estimate how many pieces per hour the operator should handle on the machine. This, we find, gives a very accurate cost and a piece-work rate can readily be set on the operation and low productive costs be obtained.

"In our plant we find that where with single spindle machines we were formerly able to handle only 200 pieces per hour and make one hole in each piece, we are now able to bore 750 pieces per hour and from one to ten holes in each piece. The same holds true in the mortising for where we formerly put through 100 pieces per hour with one hole in each piece, we are now turning out 300 pieces per hour with five holes in each. The effect on cost and production is obvious. There is no doubt but that the multiple spindle idea is entirely practical and unusually successful."

Woodworking Equipment Costs Too Much

Is the Investment in Equipment Higher in the Woodworking Field Than in the Metal Working Trade?—Comparative Figures Covering Small Plants—Productiveness of Machine and Quality of Output Chief Factors

"It costs so much to purchase new equipment" or "Woodworking machinery prices are far too high," are remarks that are heard in nearly every plant devoted to the remanufacture of wood. Woodworkers in general are firm in the belief that they are being asked far too much for any equipment they may happen to need or that the prices of such machines are away out of line. Whenever new equipment is mentioned or even thought of, the question of price seems to be the most important phase of the deal.

There must be some reason for this attitude. Woodworkers as a rule are broad-minded and are fully alive to the fact that they must pay for what they receive. What then is the basis for the idea that they are being overcharged for their machinery needs? It might come under any one of three headings, first, that the prices of woodworking machinery are higher than those being paid by other industries for their equipment, second, that prices today are away out of line with those which prevailed some years ago, this in spite of certain reductions which have occurred, and third, that the level of values which are found in the woodworking equipment field is too high in comparison to the general trend of machinery prices.

What A Comparison Shows

Let us consider for a moment the first suggestion, that the prices being asked for woodworking equipment are higher in comparison with other lines of machinery, or, to put it in another way, that it costs more today to equip a woodworking factory than, say a metalworking plant. Just to get a basis for comparison, some figures were secured, covering the average requirements of a small woodworking plant and a small industry devoted to metal work. The lists and prices are substantially as follows:—

Woodworking	
Swing Saw	$ 135.00
Variety Saw	240.00
Band Saw	300.00
12-inch Buzz	423.00
24-inch Planer	675.00
3 drum Sander 36"	2,385.00
Post Borer	76.00
2-spindle Shaper	600.00
Lathe	198.00
8-inch Sticker	1,332.00
Disk & Drum Sander	253.00
Belt Sander	495.00
	$7,112.00

Metal working	
Lathes, 16" x 6'	$1,050.00
Lathes 20" x 12'	1,663.00
"Gap 20" x 38" x 12'	2,021.00
Planer, 36" x 10'	4,073.00
Shaper 16" x 20"	1,050.00
Power Hack Saw	65.00
20 inch Drill	180.00
36" Sliding hd. Drill	1,150.00
Small miller	1,075.00
	$12,327.00

These figures would seem to indicate that the cost of woodworking equipment compares more favorably with that of metalworking tools. Not only is the value per piece much higher in the metal working trade, but the investment per productive mechanic is more than double, being $1,582 against $592 in the woodworking field. That the operator of a wood working plant or one about to invest in woodworking

equipment has all the better of any deal calling for new machines.

How About Quality?

Taking up the discussion under the second suggestion, namely that the prices being paid to-day are away out of line with those which prevailed some years ago, there is more fact than fiction in this suggestion. The cost of woodworking machines is undoubtedly considerably higher than it was years ago, and most of us are prone to look back and make comparisons. This may be the reason for the attitude which commonly prevails. There may be, however, some justification for the prices being asked to-day. The question of quality must be considered. The woodworking equipment being placed on the market to-day is a highly specialized line of machinery and is designed and manufactured with a degree of skill and accuracy and with a fidelity to detail that was unthought of years ago. This has been due partly to the demand for higher speeds and better work and also to a realization of the fact that the woodworking industry requires precision tools, the same as any other field. Raising the standard of the product in this way cannot but mean increased prices, for not only is more time required for each of the many operations performed in producing woodworking equipment, but a higher degree of skill on the part of the workmen is necessary, which means more highly-paid help.

The question of guards and protective devices of various kinds has not been without its influence. on certain machines the guards and safety devices alone account for a good 10% of the total cost or total price. This is a feature that did not enter at all some years ago, and is in reality a blessing in disguise for the safety devices found on modern equipment has annually saved the woodworking industry thousands of dollars in workmen's compensation dues and in claims for damages.

True Basis for Judging Value

The suggestion that the value of woodworking equipment is out of line with the general level of prices, does not hold. The comparison made between wood and metal-working equipment proves this. The manufacturers of woodworking machines claim that the prices prevailing some years ago were out of line, that they never represented a fair return on the cost of production, and as a result woodworkers have been educated to low prices and believe they are being over charged, when asked a price which offers a fair return on the true cost. Another point is that formerly much of this equipment was made under the apprenticeship system, with help that was fairly efficient and which was not paid very high wages. To-day none but skilled mechanics are available, for, as we all know, the apprenticeship system is a thing of the past. Anyway, as intimated before, more skill is required to-day in the production of modern woodworking tools. Taking it all in all, it does not appear as if the cost of woodworking equipment is out of proportion to the value given or that woodworkers are being asked to pay more in proportion than any other buyers of machinery of a similar quality.

The true basis upon which to judge the value of any machine is not the initial price but it is productiveness and the quality of the output. There is no doubt that present-day equipment is highly productive and there is just as little ground for argument with regard to the improved quality of the work turned out. All this means lower cost and increased output per man. It is these items which determine the true worth of any machine and which will amply compensate for any increase in cost. Not only will present-day equipment pay for itself in a short time through the savings effected, but it will continue to return handsome profits as long as used intelligently.

If your bevels on the top of the teeth are very acute so will your saw be more difficult to work. Flat tops are better than very acute angles, but a gentle slope gives the best results.

Band saws, when not in use, should be carefully coiled and hung where they will not be damaged. To coil turn the top part twice, then let it drop on the lower portion.

Modern Methods and the Trade Journal

by G. W. N. D.

A good trade journal—in the best sense of the word—has just as important a place in modern industry as modern equipment. Equipment may be well and good, but without the latest information on the best uses of that equipment how can one expect to obtain results which will enable him to survive the exacting demands of present-day competition? The columns of the technical educator devise and direct the best that can be produced from the material on hand.

The function of The Canadian Woodworker is to provide the latest and best practice in the several fields of the woodworking industry. In this service not only the editorial but the advertising pages are enlisted. Always it must be remembered that some of the brightest minds are to be found among those who have sufficient enterprise to spend considerable sums upon the extension of their trade connections.

Now we are persuaded that the practical men in the woodworking industries of Canada constitute the very backbone of the country's industrial establishment, and it is our constant aim to produce a paper which breathes forth this conviction from cover to cover.

The part of the reader in our scheme of things is just that bit of practical information which crops up in the trivial round and common task, and which serves as the basis of the most helpful, educational material that can be published: how this and that economy was developed in a certain plant by the use of certain equipment; how a saving was effected here and there: here, perhaps, by the substitution of a different kind of material, and there, possibly, by turning over a portion of the operation to skilled instead of unskilled labor, or vice versa. It means nothing as to how the idea is worked up from a literary standpoint. It is the idea itself that is wanted.

Modern methods within the province of the trade journal boiled down spell one word—co-operation. Co-operation between the journal and the industry,—between the journal and each individual reader and advertiser. .Co-operation with the reader; service to the advertiser. Modern methods spell co-operation, and co-operation spells efficiency.

Could You Make These Doors for $27.60?

The Other Fellows' Prices Are a Poor Basis for an Estimate—Lumber Burden Sometimes Overlooked—Comparative Figures on Set of French Doors

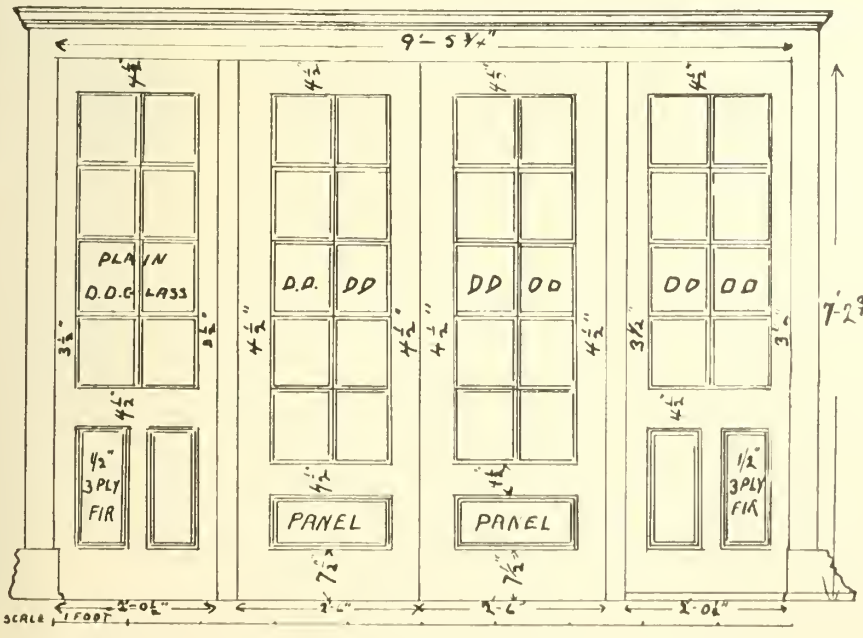
At the present time competition is extremely keen in the woodworking field, particularly in that section devoted to the production of made-to-order millwork, and as a result prices are being cut to the last notch. This condition should pre-suppose a thorough grounding in costs, so that all prices given, particularly the low ones, are based on a ground-work of accurate cost knowledge, enabling the person responsible for the quotation to make it in a reasonable and intelligent manner with a full knowledge of the anticipated profit. This is the only way in which a millwork business can be conducted with any degree of assurance as to the results of each day's efforts.

In this connection the cost studies which have appeared in recent issues of this publication should prove of real assistance. To those who do not keep cost records but who base their prices upon lists and quotations made by others or upon that uncertain basis, years of experience not backed by cost records, these articles should have a strong appeal, for through the figures given, they are able to compare their idea of prices with those prevailing throughout the industry. Even to those who know their costs, the comparative figures accompanying each article should carry a message, as to a certain extent through them the efficiency of plants, methods and departments may be compared.

Some day, and not in the far distant future, definite standards of performance will be universally recognized in our industry. These may be basic time standards for various operations or there may be some form of standard hour, but whatever form these standards may take, when once established, they will enable any woodworker to determine whether or not his particular plant and each department of his plant is above or below the general average or standard.

Before going on to a discussion of the cost estimates submitted on the set of French doors selected as the subject for the cost article in this issue, it might be well to touch on that all-important factor, lumber burden. It is doubtful if more than a few of the better-informed woodworkers realize just what this lumber burden is and how it eats into their profits if they have neglected to consider it or to take account of it when figuring costs. A careful check of many of the large woodworking plants in Canada and the United States has established with a reasonable degree of certainty the fact that it costs $6.00 per M. to store lumber in the yard and deliver it to the factory door. This figure does not include kiln-drying but is made up of such items as interest on the money tied up in lumber, handling and teaming charges in the yard; interest and taxes on the land on which the lumber is stored; upkeep of lumber yard and other items of a similar nature. If the stock is kiln-dried, a further charge of $6.00 should be tacked on to cover the cost of the drying operation. This means that kiln-dried lumber, delivered at the factory door, should carry a burden of $12.00 per M. feet. These figures may appear to some to be excessive but whether or not the correctness of this lumber burden is admitted, the fact remains that every woodworker is faced with a lumber burden, and unless he makes proper provision for it in costing and estimating, he is sure to sacrifice some of his prospective profits.

In some plants the practice is to apply the lumber burden in the form of a fixed percentage on the cost of lumber. This is not the correct method as it does



The cost study of these French doors reveals wide discrepancies in the various items involved, which should not occur were costing and estimating on a proper basis. See the comparative figures on the next page.

not give a true lumber burden. It may divide up the yard overhead and over a twelve-months' period absorb all carrying charges, but the burden itself is not evenly distributed, as 10% on mahogany costing $3.00 a M., gives a lumber burden of $30.00, while the same percentage on pine at $100.00 is only $10.00, yet the handling cost and yard burden is practically the same in each case. Thus it will be seen that the only true and accurate way to apply a lumber burden is in the shape of a fixed amount per M. feet. The amount to be applied will vary in each plant but from $5.00 to $6.00 per M. is not an excessive amount when every burden factor is taken into consideration.

The French doors, shown in the accompanying illustration, were submitted by a reader in Western Canada who has taken a great interest in these cost studies. In sending in the data covering this job, he asks if it is advisable to make the same overhead charge for the glazier as for the cabinet makers, viz., 30 cents an hour, and also if 10% is sufficient to cover the waste in cutting and handling glass. His figure of $41.85 is not very far out and at the price received for this work, a very satisfactory profit was made.

Details of Original Cost on French Doors

45′ clear E. G. fir 1½ rgh, at $70.00	$ 3.15
waste 25 per cent	.80
9 sq. ft. 3 ply fir ⅜. at 15 cents sq. ft.	1.35
waste 25 per cent.	.45
20 lts. D. D. glass 12 x 12. at 10 cents each.	2.00
16 lts. D. D. glass 10 x 12. at 8 cents each.	130.
waste 10 per cent.	.35
150 lin. ft. stops at ½ cent per lin.	.75
Machine time, 6 hours at $1.25 per hour.	7.50
Bench time, 18 hours at $1.00 per hour.	18.00
Glaziers time, cutting glass, 1 hour at 80 cents.	.80
Factory Cost.	$ 36.45
Com. Bur. 15 per cent.	5.40
Net Cost.	$ 41.85

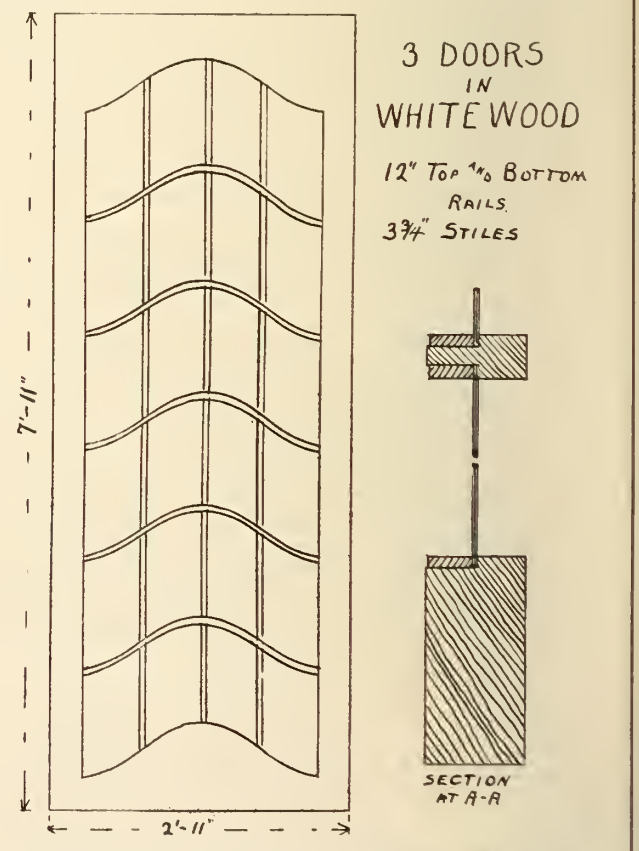
List of Estimates Submitted

No.	Material	Waste	Bench Hrs.	Rate	Machine Hrs.	Rate	Commercial Burden	Total
1	$4.60	10%	7	.80	4	$1.00	10%	$27.60
2	6.30	12	6	.85	7	1.10	15	31.00
3	5.15	25	4	.80	9	1.25	20	32.40
4	5.60	15	7	.90	8	1.10	15	34.65
5	7.40	20	8	1.00	6	1.15	10	35.90
6	4.37	25	6	.90	7	1.25	15	36.22
7	10.24	25	6	.80	7½	1.50	20	37.73
8	6.35	15	9	.85	11	1.15	20	39.15
9	**5.75**	**25**	**18**	**1.00**	**6**	**1.25**	**20**	**41.85**
10	8.15	15	11	.90	12	.95	15	43.90
11	12.09	12½	9	.85	6	1.07	20	45.31
12	6.75	30	16	1.00	5	1.10	20	46.35
13	7.15	25	13	1.00	8	1.30	20	48.90

In view of the variations in material as shown in the accompanying list of estimates submitted, a number of articles dealing with the taking off of quantities from millwork orders might not be out of place. It seems strange, to say the least, that where one figures 45 feet of fir will complete this order, another estimates that 125 feet will be used. This is far too great a difference. There should be some uniform method of taking off quantities that would result in a greater degree of uniformity in the material column. The percentage of waste varies in almost every estimate. Here again there is something wrong, as the amount of waste on an order of this kind should not vary very much in different plants.

In this connection one woodworker wrote in commenting on the figures covering the set of stairs, shown in the last issue. He vouchsafed the opinion that most of the estimates published were away out as far as waste percentage was concerned, as the actual waste on a job of that kind would run anywhere from 30 to 40%. Is this right? There is little doubt that 10 and 15% wastage is totally inadequate for stairwork, but it is donbtful if 40% does not go to the other extreme. This woodworker may not be using the most desirable grade of material for his door work or his methods or workmen may be wasteful. It is always well to check one's own methods and results thoroughly before concluding that a competitor is entirely at fault. There is no doubt that many woodworkers fool themselves by not allowing sufficient for waste. Not recognizing factors of this kind, is an extremely unwise policy, because such discrepancies must be taken care of in some way or other, and if an adequate allowance has not been made, they come out of the profits.

Another special door order has been chosen as the subject for the cost study for the July issue. This, as will be seen from the accompanying illustration, is of an unusual design and entails a considerable amount of shaper work. For this reason it will be extremely interesting to see how the various woodworkers figure a door of this type. Owing to the special nature of the work, it is more than probable that the quotations sent in will show more than the usual variation. Make a point of seeing that you have a figure



The subject of cost study for the July issue—a special door job should afford interesting information. Make a point of sending in your estimate of cost immediately An unusually large list of figures is hoped for.

in for the next issue. Don't wait to be asked but send it along by the next mail. When writing in, if you have completed some work recently that you think would make an interesting cost study article, full details of the cost, together with a sketch of the job would be appreciated.

Making Glue Joints on the Linderman

One Canadian User Claims that it is the Most Profitable Machine in His Plant—Tops Jointed and Glued at $4.00 per M. Feet—Extremely Satisfactory in Hands of Skilled Operator

By GEO. H. HAWLEY

The furniture manufacturer who cuts up more than 3,000 feet of lumber per day, may consider himself as working at a disadvantage if he does not glue it up on a Linderman automatic glue jointer. In days gone by when the lumber we bought was wide enough and clear enough to almost make a whole dresser top without a glue joint, we did not feel the need of such a machine, but now that the majority of the lumber we are able to buy, and particularly hardwood lumber, is of such quality that it must be ripped up into narrow strips to eliminate all its imperfections, and these strips must be built up into pieces containing from four to ten glue joints. It is then that the automatic glue jointer becomes an absolute necessity.

With keen competition, the reduction of cost is a matter of prime importance, and even though the first cost of the machine is high, its economy in labor and material is such as to very soon pay for the machine and give large dividends on the investment. In the first place it enables us to buy a cheaper grade of lumber and build it up into first-class material at about 60% of the cost of any other method. Having been in charge of factories, where the different methods of joining wood together has been in use, most of my life, and having made a study of it, I find that the automatic dovetail glue joint is the only way to do it if we hope to keep in the lead in our line of business.

First, let us consider cost as that is the most important item to-day. Years ago we jointed our material by hand on a buzz planer, matched it up into gluing widths on a rip saw, warmed the joints in a heater and clamped together, a lot of hand clamps being used which after being left on the material for about two hours in order that the glue should become thoroughly ard, had to be removed ready for the next lot. By this method four men, if they were hustlers, could joint, match up and glue approximately two hundred dresser tops containing 1,200 feet of material in ten hours at a cost of $14.00 or about $12.00 per thousand feet. Next came the continuous feed jointing machine, which helped the situation some as it put a small tongue groove in the middle of the joint adding some strength to it, and with this machine came the rotary glue clamp carrier which helped the clamping operation some as it saved the handling of the clamps. These devices enabled four men to joint and glue up about 2,000 feet of lumber in ten hours if they hustled.

Next came the Linderman automatic machine with which to-day four men are jointing and gluing from four to five thousand feet of hardwood lumber and making a stronger joint, also ripping it to widths at the same time, in ten hours, at a cost of less than $4.00 per M. Another advantage in the use of this method is the floor space it saves us. The majority of furniture factories to-day are short of room in the machine room, and the Linderman, we find, requires just half the floor space to glue up 5,000 feet of material that was taken up by the old method. My reason for basing my estimates at four men as a gluing staff, is because that is all it requires to operate the machine, the two feeders and the operator in the middle of the machine, who when the material is wide enough, puts it into the self-feed ripping saw, installed at his right hand, and the fourth man to take it away, place it on a truck and hand the rippings back to the right-hand feeder. It is also essential for the fourth man to watch for an occasional bad joint which is generally caused by crooked or twisted material and should be ripped and run over again before it goes to the planer. Originally it took eight men to joint, glue and size up the five thousand feet of lumber that we can now accomplish with four, and it also took more than double the floor space.

One important feature is the fact that the joints do not need warming, as owing to each joint being glued and run together instantly, the glue has no chance to get cold, as is the case where six or more joints have to be covered with glue and then all placed in position while several clamps are screwed up.

Still another feature any cabinet maker will agree with me that a glue joint that is rubbed together makes a stronger joint than one that is simply squeezed together. Now the tapered wedge glue joint made on a Linderman when the dovetail is run together, causes the glue to be thoroughly rubbed into the pores of the wood and forces out any surplus glue, of which there is very little, as the brushes wipe it off the joint and put it back into the pan instead of on the floor.

I have heard people remark when they were looking at the machine at work, that it must be a very complicated machine to operate, and they would think it would get out of order, but this is all wrong. For a machine that does the fine accurate work that they do, there is very little to get out of order and the machine is more than human in the perfection and accuracy of the work it does; in fact it shows a great deal of skill and study on the part of the inventor to design the different parts in such a way as to make them almost foolproof and so simply and strongly built that with reasonably good care they will not wear out in a good many years.

The one we have, has been in constant use for nine years and we have had very few replacements to make on it. Even the spindles which run at 4,000 r.p.m., are so superior in design to almost any other machine that there is no comparison. These spindles run in tapered phosfor bronze sleeves and require almost no adjustment, are lubricated in a simple and positive manner by a high-grade lubricating grease under pressure, and are not constantly giving trouble like a babbit bearing. This machine also has the tilting bed which enables us to glue up stock at any angle or curve desired. It may be put to quite a number of

uses, such as putting stiles on the ends of desk lids and tablet slides for office desks, gluing up cores for veneered work of any thickness, and using several dovetails, it makes a superior joint for material that has to be resawed by using the double cutters and resawing between the dovetails, leaving a dovetail in the centre of each panel; in fact a very wide range of work can be done on one of these machines, especially on one with the tilting bed.

Two or three things are necessary for the making of good glue joints. First, it is essential when a machine is installed, to have an expert operator come from the factory and teach two men how to adjust and operate the machine so that if one is absent from any cause, the other can take his place. The expert should stay with the machine for a couple of weeks till he is sure that the men he is teaching are both competent to make all adjustments and understand all the different parts of the machine most thoroughly. In selecting two men for this position, care should be taken to choose men who will be likely to remain, men who are settled in the place and will be pretty sure to stay on the job. It is a great mistake to instal one of these machines and set a man to study it out for himself, and it is worse yet to let Tom, Dick and Harry run the machine and then blame the machine for the results. The same man should be kept in the middle of the machine. Any one can feed at the ends. The reason we have had such excellent results with ours is that the same man has been operating it for eight years, and the quality of our joints proves that it has paid to keep him there, and to make a long story short, after using a Linderman glue jointer for eight years, we consider it the most profitable investment in our factory.

Douglas Fir for Washer Tubs

How Suitability Was Determined—Report of Forest Products Laboratory, Montreal—Has Definite Advantages Over Metal

By W. McD. TAIT

It is a fact very well known in the lumber industry that Southern or Louisiana Cypress which has grown for centuries in the low lying lands about the mouth of the Mississippi River is becoming fast depleted. This is, perhaps, better known to manufacturers who have occasion to use this wood in the articles they produce. Washing machine manufacturers are in this class and are feeling the scarcity of cypress most keenly. It is not generally known that there is another wood which is equally as good if not better than cypress for washing machines. This brings us to the point of this article for it has been found by laboratory test and by actual use extending over a period of years that Douglas Fir is eminently suited for washer tubs.

I have before me a bulletin issued by the American Washing Machine Manufacturers' Association in which there is listed all washers sold in America. Classification as to type is not important for the purpose of this article, but classification according to material used is extremely interesting. Out of two hundred washers listed, one hundred and fifty-six made of wood. Analyzing this latter list, in five, Douglas Fir is specified as the material of construction; in one, Yellow Fir; and in another, Oregon Spruce. In the remaining one hundred and forty-nine tubs some variety of Cedar, mostly Louisiana Cypress, is used.

Admitting a shortage of cypress which, of course, must be heart or dead wood, it is apparent that very soon washer manufacturers must look elsewhere for material for tubs. Our own buyer was compelled during the last three years our firm used cypress, to go to the cypress swamps in Louisiana in order to get lumber that could be used at all in our tubs. And even this selected material did not make tubs up to the standard of our other lines.

Adapted After Thorough Tests

Fortunately our firm foresaw this possibility and about five years ago began to test Douglas Fir to ascertain its suitability. Two distinct lines were followed. In the first, tubs of Douglas Fir were made and given to employees to be used regularly in their homes. These tubs were put to varying tests. In some cases water was allowed to stand in them, inviting decay of the wood, but not even a tendency in this direction was noticed. Other tubs were allowed to stand in semi-heated places in the week between washings—this to induce shrinkage—but in no case were any leaks found after water was first put into them. They were also found, when the least air was admitted when not in use, not to mould or give off any offensive odor. It should be said here that these tubs were tested at London and Fergus, Ontarrio, where an atmosphere much dryer and more variable than that prevailing in B. C. was to be encountered.

The second series of tests were carried out for us by the Forest Products Laboratories at Montreal. These tests justified our belief that in Douglas Fir there was available a material that would fill all the requirements of a washer tub.

In writing us after the laboratory tests R. J. Blair, Pathologist, says in part:

"When wood is used for such purposes as the manufacturer of laundry tubs there are two independent relations regarding moisture which may be considered. These two conditions are the shrinking and swelling of the wood due to its moisture content and decay of the wood which results from keeping it permanently moist.

"The special advantage over Douglas Fir which Louisiana Cypress is supposed to possess is its greater resistance to agencies causing decay . It is not thought however that this consideration should be of any importance in laundry tubs. With a washing machine used once a week and stored in a dry place the tendency of the wood to decay would be so slight that Douglas Fir is quite suitable. If the wooden part of the machine is encased in a tight metal casing so that the wood might remain permanently moist the Cypress would be preferable.

"It would not appear that the difference in shrinkage of Douglas Fir as compared with that of Cypress should be of sufficient extent to make the Fir unsuitable for the manufacture of tubs.

It is worthy of note that Mr. Blair has some doubt

about Cypress possessing greater resistence to agencies causing decay than Douglas Fir, for he says "is supposed to possess" and goes on to say that "this consideration should not be of any importance in laundry tubs."

Strength a Desirable Feature

A point not mentioned in the report but which is of great importance in washers that have moving parts set on the wood work of the machine, is that Douglas Fir is considerably stronger than Cypress and should therefore stand up better against any mechanical wear to which the wood might be subjected in use.

Four of the five washers referred to as using Douglas Fir tubs are our own, and we have now had them in commercial use long enough to know that no mistake was made in our change of material. What a wonderful field must open up when the use of Douglas Fir for wood tub washers becomes general! When one stops to realize that between the years 1914 and 1919 the washing machine industry in America jumped from $7,600,000 to $50,381,000, an increase of 663 per cent, there must surely be found in the very near future a new market in the washer manufacturers of America.

There is no reasonable ground for supposing that any material will take the place of wood in any larger proportion of washers than are in use today. On the other hand there are many reasons for hoping that the proportion of wood tubs may be largely increased. The following are a few:

Is Preferable to Metal

The wood tub keeps the water hot much longer than the metal tub because wood is not a conductor of heat and metal is a good conductor. We have found that our tubs, which are 1¼ in. Douglas Fir, keep the water so hot that even after the washing you cannot allow your hand to remain in it. We have filled our tub with hot water, closed the lid, and allowed the water to stand for 24 hours. At the end of that time it was still warm. This could not be done with any kind of metal tub. Wood will always be the material used where retention of heat is desired.

The wood tub keeps the operator cool. The advantage of this will be noted any hot summer day when washing is being done in a kitchen or small room. The wood tub is the coolest tub to use.

The wood tub will not rust. This argument can be used very effectively anywhere on the coast where a damp, salt atmosphere is always prevalent. The metal tub will rust, and rust will soil and stain.

The wood tub is easy to care for after use. A dipper of water will clean it out and it is ready for use again. Soap will not corrode on it and its appearance is not spoiled by the action of soap and water. Metal tubs are often a pretty sight after they have been in use a few months.

Pioneer Western Woodworker Passes

Another of the fast-vanishing little band of "old timers" of Western Canada has passed in the person of Alex. Brown, Sr., who died at his home in Winnipeg on April 13th. Alex. Brown, or "Sandy," as he had been familiarly known to his many friends, was born in Ayrshire, Scotland, and came to Canada when a very young man. He settled in the West in 1872, and with Thos. Rutherford of Galt, Ont., formed a partnership known as Brown & Rutherford, to engage in the woodworking and lumber business. This business still exists, and from an inconspicuous start in a small factory, has developed into a large plant, enjoying an extensive trade.

The business of Brown & Rutherford is to be conducted by the sons of the two original founders of the company.

Turning Wood Waste into Dollars

When properly handled, wood shavings and hogged wood waste have a fuel value equal to 75% of that of coal. Even when hand fed, if done efficiently and with a full knowledge of all the requirements of good combustion, the efficiency of wood waste is in the neighborhood of 60% of that of coal.

To benefit from the full heat value of shavings and wood refuse, it is necessary to feed it into the fire-box without the admission of air. This can best be accomplished with some form of stoking equipment which carries the shavings into the fire-box in a steady, uniform stream and distributes it evenly over the fire. When the shavings are fed in through a spout, a large volume of air is admitted, the volume increasing as the flow of shavings diminishes. Not only must this air be heated, thus taking heat which would otherwise reach the boiler, but this large volume of cold air tends to check and retard the combustion of gases in the fire-box. With this in view, tests have shown that in many cases it costs money to burn shavings in this manner. By that is meant that less coal would be required to maintain the desired steam pressure if the shavings were not fed into the furnace, so that a larger percentage of the heat generated by the coal would be used for maintaining steam pressure.

The three main essentials necessary for the economical burning of shavings are:—First,—Continuous, uniform feeding of shavings in concentrated mass and in sufficient volume to keep grates thoroughly covered to a uniform depth but not too deep spreading over the entire grate area, carefully avoiding all bare spots through which excess air could enter. Third,—A correctly proportionate, uniformly-maintained air supply through the grates only, and by no means above the fire-box, carefully avoiding excessive amount of air over and above that required to supply complete combustion.

A properly proportionate air supply is impossible when shavings are fed in varying and intermittent quantities direct from the separator. The excess volume of air admitted in this manner serves no useful purpose but absorbs a large amount of heat since it enters the fire-box at a temperature of about 70 degrees and leaves at a temperature of from 450 to 500 degrees.

From this it would appear as if properly burned wood shavings and other forms of wood refuse are worth from two-thirds to three-quarters as much per ton as coal. In view of this it would pay many woodworkers to give greater attention to the burning of their waste material.

You can't get back a finger or a hand after it is cut off. But you can save your hand by being careful, by watching your work, by not taking a chance, by using your head, by avoiding danger.

Do You Specify Good Wood Boxes?

Do all Box Makers Pull for Their Own Product?—Extensive Publicity Movement in Favor of Good Wood Packages Under Way—Each Individual Can Help in Some Small Degree

The wood box industry of Canada, being unorganized, is not in a position to do very much to promote the use of their own product. This is unfortunate and is to be deplored. The American box men, through their organization, the National Association of Box Manufacturers, have been conducting an aggressive publicity campaign in favor of the use of wood boxes with extremely satisfactory results.

Not content to rest their case upon trade periodical advertising and direct-by-mail literature, they are making a determined effort to persuade wholesalers, jobbers and retailers to insist that all goods shipped them be packed in good wood boxes. Over 35,000 poster slips bearing the suggestion,—"Believing that the best interests of manufacturers, retail grocers and wholesalers require the most serviceable container, we request that the attached order be shipped in good wood boxes," have been distributed. The cooperage men have also decided on extensive publicity work, and both the box men and cooperage manufacturers are working under the slogan,—"Insist on having your goods shipped in the wood package."

Demand Better Packing

It has been found that the wholesale grocers of the country are almost unanimous in their desire to abolish the use of inferior substitute containers in favor of the wooden shipping package. They realize that they are being faced with large losses from pilferage, damaged and soiled goods because of the widespread use of containers which are not proving satisfactory. False economy on the part of manufacturers and shippers of various commodities is causing their customers huge losses, and the solution lies in the use of good wood packages.

Secretary Pease, of the National Association of Box Manufacturers, has been in touch with a large number of wholesalers, and in reply to a request for an outline of their experiences, he has received many pertinent communications. The following clippings from letters received, indicate beyond the shadow of a doubt the attitude of the wholesalers and jobbers on the question of proper packing:

"We believe that many manufacturers are making a mistake by trying to reduce overhead expense by using cheap packing cases. We believe that a good many products could be more profitably handled by all concerned if packed in good wooden cases, even though the first cost was a little higher.

"We have in mind one product that has always been packed in good, soft wooden cases and it has always been a pleasure to handle the goods. We have had less loss on this article from damage in transit than any other commodity we have ever handled. We refer to 'Arm & Hammer' soda and we might say that soda would carry better in fibre cases than a good many other articles that are so packed; but the Church & Dwight people seem to be far-sighted enough to continue to pack in cases that make it a pleasure for wholesale and retail dealers to handle.

"The fibre box proposition has been an expensive one to the wholesale grocer.

"We are sick and tired of losing money on goods shipped us in fibre boxes by virtue of having to stand loss and damage claims.

"The fibre container is not at all satisfactory for canned goods or any package put up in tin, because it absorbs more or less moisture which causes the tins to become discolored and rusty far more quickly than the wooden packages do.

"We are particularly against the receiving of so many goods packed in paper cartons.

"We hope that you will be successful in persuading all the canned goods manufacturers in the United States to use the wooden box, as it is by far the most satisfactory container. It is an imposition on the jobbers to ship them canned goods in paper boxes."

All Wood Users Interested

An appeal is being made to the various branches of the wood-using industry to insist, wherever practicable, that all supplies, etc., purchased be delivered in wood packages. This applies to the man who buys his oil in steel drums rather than in wood barrels or who receives certain forms of supplies in bulk instead of in boxes. All wood-users should be interested in encouraging the use of wood boxes. They stand to benefit because boxes are made from the low ends of lumber, and anything that tends to move this low-grade stock at anything like a reasonable price, will enable the lumber producer to sell the upper grades at a lower figure. To put it another way, with present conditions the sale of the better grades of lumber must pay a profit on the low-grade stock.

To bring it right home to the box industry, many box manufacturers insist that wherever possible all their supplies be shipped in wood boxes. Have you ever when placing an order, insisted that wood packages be used? If not, it is not to late to begin. This is one instance of where the individual box man can do something to promote the welfare of his industry.

Growth of B. C. Box Industry

The B. C. box and shook industry has developed to such a size that it is hard to realize that it was only seven years ago that this important industry began to grow. Before 1915 the consumption of B. C. woods for boxes and shooks was so small that it was not even given a place in government returns. Commencing with 1915 the growth and development of the box business may be traced from the following government figures which give the value of lumber manufactured into boxes and shooks by B. C. plants:—1915, $750,000. 1916, $1,833,000. 1917, $1,611,880. 1918, $1,845,195. 1919, $2,142,000. 1920, $2,650,000. 1921, $2,000,000. In the latter year, 1921, the domestic consumption of lumber for boxes was 25,000,000

feet, and the volume of box lumber exported amounted to 20,000,000 feet.

Part of this growth may be attributed to the demand for shell boxes during the years 1915, 1916 and 1917, the need being far greater than the supply. Existing plants were enlarged and new plants built and equipped. When the shell box business fell off, these concerns were forced to cater to commercial requirements to keep their plants in operation and found it necessary to seek business far afield, with the result that nearly 50% of the output of B. C. boxes is for export trade.

Attractive markets for B. C. boxes and shooks have been developed, both at home and abroad. Large quantities of shooks are required each year by the fruit packing and canning industries in B.C. Then the western product is shipped as far east as Ontario where it competes more or less successfully with eastern boxes. Many thousands are sold annually in California while immense quantities are shipped to Japan, China, Australia, India and other foreign countries.

Every imaginable kind and shape of box is made. A partial list would include the following:—Soap boxes, milk boxes, fresh fish boxes, dried fish boxes, canned salmon boxes, canned fruit boxes, jam cases, pickle cases, vinegar cases, honey cases, candy boxes, match boxes, meat boxes and crates, hardware cases, dry goods cases, fruit cases, fruit boxes, berry boxes, berry crates, tin top baskets, oil cases, butter boxes, cheese boxes, storage boxes, biscuit boxes, vegetable boxes and crates, and, in fact, boxes, cases and crates for every imaginable commodity.

The limit has not been reached for there are many desirable fields that are yet undeveloped; for instance, the tea trade in India and the middle East uses hundreds of thousands and even millions of boxes annually. This also holds true of the rubber and desicated cocoanut trade. Many of these cases are of peculiar design and construction but are not beyond the capacity of B. C. factories, and if a determined effort were made to secure a share of such business, it would help swell the ever-increasing total of B. C. box products.

Paying for Punctuality

In order to encourage punctuality and make it worth while for his employees to be ready for work before the starting time and to work right up to the closing time, one large woodworker has adopted the policy of adding one hour's pay per day to every workman who registers "in" on the time clock on or before 6.50 A.M. and 12.50 P.M. and registers "out" at 12.05 P.M. and 5.05 P.M. Under this system the employee is at his bench or machine fully prepared to start work at the stroke of the hour and works right up to the closing point without knocking off to wash up and make other preparations for leaving; in other words, he produces for the full nine hours. This works out at the rate of an hour's pay for 15 minutes of time or quadruple pay for the overtime period. Another feature is that this idea also tends to prevent congestion at the time clocks.

When you are buying trucks for moving the work in the mill, give the matter a considerable amount of thought, so you will obtain those which will give the best results.

Chart Shows Length of Belts in Rolls

By W. F. Schaphorst, M.E.

Use this chart when you want to know the number of feet of belting in a given roll.

The sketch shows how to measure the roll. The distance "X" must be measured in inches—a much simpler method than the ordinary rule as found in handbooks.

For example. How long is the belting in the roll which has 36 turns distance "X" being 50 inches.

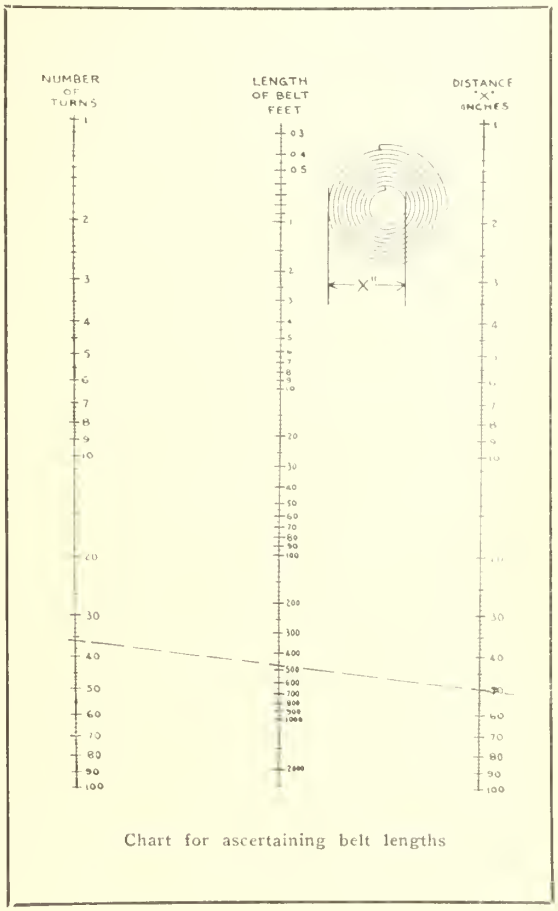


Chart for ascertaining belt lengths

The dotted line drawn across the chart shows how easily the length is found—it is 470 feet.

It will be noted that the range of the chart is very great and will easily cover any ordinary roll.

You needn't actually "draw a line" as I have done. Just lay a straight edge across from point to point and the intersection with the middle column gives the length of the roll immediately.

The method is so simple and obvious that I believe further explanation to be unnecessary. A little practice will soon make you an expert.

Credit Where Credit is Due

Through an oversight the proper credit was not given for the article on "How to look after band saw teeth" which appeared on page 65 of the May "Canadian Woodworker." This material was taken from the "Disston Crucible" an interesting monthly publication sent out by the Henry Disston & Sons, Inc., Philadelphia, Pa.

Credit Terms in Millwork Industry

Millwork Manufacturers Should Revise Terms to Meet Present Day Conditions—Net Thirty Days or One Per Cent Ten Days Should be the Limit—Contracts for all Forms of Special Work

By J. A. LOETSCHER*

Credit is probably the greatest single factor in our industrial and commercial life. It is one of the basic fundamentals that has really made American business possible. The granting and receiving of credit by our business men has, no donbt, been responsible, in a greater degree, than any other individual influence in the rapid development of our country. Even our large net work of railroads, which really made this development and expansion possible, was almost entirely built on credit. Without credit, business would still be done on the small scale of the olden days, and the business man would still be an insignificant trader, given to barter. Credit, more than any one other thing, has made possible the modern big organization with its up-to-date systems. It has also given us the big manufacturers, recognized on all sides as the great captains of industry.

In discussing this subject of "credit," I believe we were to take for our text, more specifically, the question of credit terms and discounts. In recent years there has been a decided tendency to shorten credit terms. This change was induced and helped along by developments due to the war.

Long terms were started when there was a real necessity in the early days of the development of the country, banks were small and few, and real money very scarce. But, this has all been changed. Farmers sell their products largely for cash, and as a class, except for the present period of re-adjustment, have never been so prosperous as in recent years.

Evils of Long Terms

Labor is paid weekly, twice a month, or occasionally monthly, so why should they not pay their bills in the same way as they go along? Long and easy terms tend to make people live beyond their incomes; or even to go to still further extremes, and indulge in wild orgies of extravagance and foolhardy speculation. If we shorten the selling terms, just as much merchandise, at least in our business, will be bought and used and the greater part of the money is more apt to be earned before it is spent. Again, the policy of short terms and prompt settlements will do the retail dealer a real service, since it will develop better business methods and show him a shorter road to prosperity, and thus perhaps even save many of them from ultimate failure.

"Sixty days" terms mean at the very least two months' business on your books and ours. "Thirty days" terms should mean only one months' business on the books. If we can reduce our outstandings or investment in book accounts, we will be able to improve our condition by borrowing less money. Business then will have more money available for expansion and development. Money will be easier and more readily find its way into new buildings—particularly new homes, which are needed so urgently. The best authorities estimate that the country is short about a million and a half homes.

Since the country has only been building on an average about three hundred and fifty homes per year, we should have four or five peak years some time in the near future, when things get started again in a normal way, and especially is this case, if, in addition, we knock off twenty to twenty-five per cent. of the present deficit or shortage of homes.

Short Terms becoming Universal

Many different lines have already adopted the "Thirty Days" terms. With many manufacturers, such short terms have been of long standing. In our own business, plate glass has been thirty days net or one per cent. for cash in ten days, for twenty-five years or more. Nevertheless, we always allow the trade two per cent. cash discount. Practically all our tools and shop supplies of every nature, in fact everything in the metal line is sold on terms of thirty days net. Only occasionally is some item billed on a basis, allowing us one per cent. for cash in ten days.

In recent years, or to be more exact, about eight years ago, the window glass manufacturers also adopted shorter terms, allowing us only one per cent. for cash in ten days, or thirty days net. However, notwithstanding these changed conditions, we continue to allow two per cent. cash discount, though the glass and glazing represents fully seventy to seventy-five per cent. of the value of every glazed sash sold to the trade. Then, too, in order to earn our one per cent. discount, we are "required" to make payment within ten days from date of invoice, of at least ninety per cent. of the invoice price, notwithstanding the car may be in transit from three to six weeks, and frequently, owing to congested traffic conditions, as much as two months.

Many Items Not Subject to Discount

But there are a few items, which none of us as manufacturers, can discount, namely: Wages, freight paid on raw materials, insurance, taxes of various kinds and degrees, traveling and other expenses, and salaries, interest, etc. This account of cash discount, therefore, is always a "red ink balance" shown on the wrong side of the ledger.

Wages alone generally average from twenty-five to thirty-five per cent. of every Sales Dollar, depending somewhat on the nature of the work and whether or not the volume is made up largely of stock stuff or a varied line of special millwork, covering plan work and the like. Freight paid out for raw material and other incoming shipments also will average from twelve to eighteen per cent. of the total sales.

Another reason why we should shorten our selling terms and reduce outstandings, is because the present market, due to the war and existing abnormal and continuing inflated conditions, has added very materially to the value of our inventories. In other words, we are all obliged to tie up more money in the stocks we

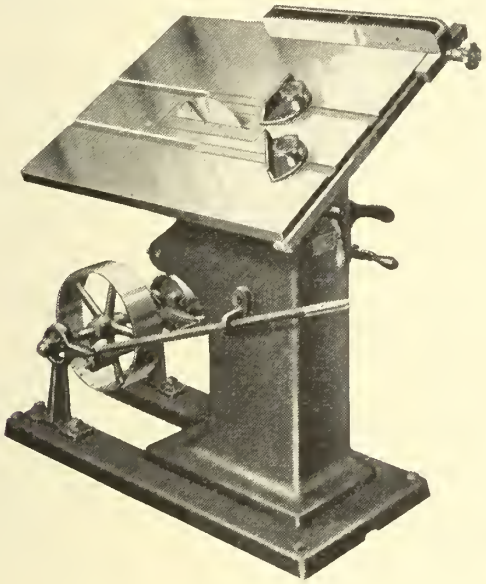
(Continued on page 96)

*Of Farley and Loetscher Mfg. Co., Dubuque, Iowa. Address before the Millwork Cost Bureau.

Machinery & Equipment

"Williams" Light Variety Saw

The accompanying illustration shows a "Williams" light variety rip and cross-cut saw, as recently put on the market by the A. R. Williams Machinery Co., of Toronto. It was designed particularly for use on light cabinet work and for the assembling department in furniture factories and woodworking plants. The frame is cast in one piece and has an extended sub-base which carries the countershaft. Provision is made for adjusting the countershaft so as to take up all slack in the saw belt. The table is 29 x 32

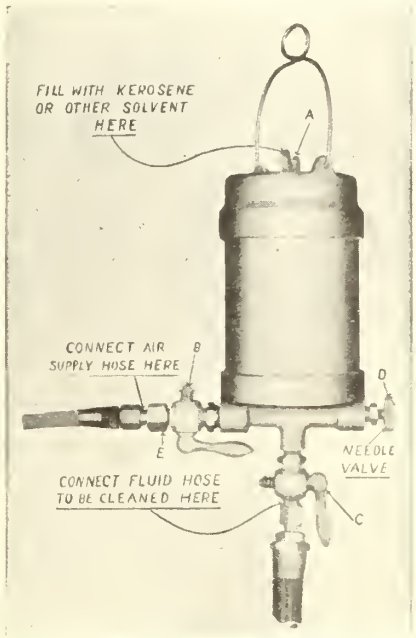


A. R. Williams light variety saw table

inches with a wood throat piece 11 x 3 inches, permitting the use of dado cutter. The table will tilt to an angle of 45 degrees. The ripping gauge may be used on either side of the saw. Material up to 12 inches wide may be ripped on the right-hand side of the saw, and stock up to 8 inches on the left-hand side. Saws as large as 11 inches in diameter may be used, enabling stock up to 2 inches in thickness to be ripped. The saw is raised or lowered by means of a lever and swings from a pivotal point on the back of the frame. The machine is extremely easy on power, requiring only from 1½ to 2 h.p.

Hose Cleaning Device

It is not a very easy matter to keep the hose of the spray nozzle clean and free from hardened finishing materials. A device which will help overcome any trouble that may be experienced in this direction has been recently put on the market by the DeVilbiss Mfg. Co., Toledo, Ohio. This is shown in the accompanying illustration. It consists of two brass castings connected by steel tubing. The lower casting carries the air inlet valve, the outlet fluid and air valve and the fluid needle adjusting valve. The upper casting is funnel-shaped to facilitate filling and has a wing nut to close the opening. The cleaning device is filled with some suitable solvent which is permitted to flow into the air line, the amount going through being controlled by the needle valve, where it is thoroughly mixed with the air. A combination of air and solvent

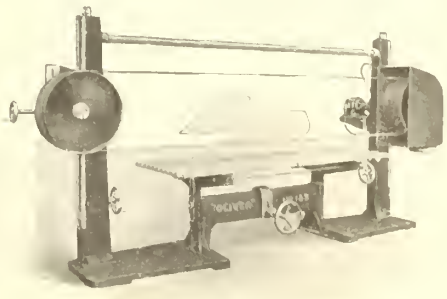


Hose cleaning device for sprayers

being forced through the spray hose, quickly removes all finishing material which may be clinging to the interior of the hose, and ensures that the hose is thoroughly clean. The claims made for this device is that it lengthens the life of the hose, cleans it quickly, ensures quality spray work and prevents a loss of solvent through evaporation.

Reversible Belt Sander

The new No. 183 reversible belt sander, recently placed on the market by the Oliver Machinery Co., Grand Rapids, Mich., is designed for the rapid sanding of line and edge moldings, straight, flat and ir-



Oliver reversible belt sander

regular surfaces and for sanding and finishing built-up pieces such as cedar chests, chairs, kitchen cabinets and all kinds of medium size pieces of furniture. It will take work of any length and sand to the center

of 72". It will take work on the table 42" high or by unbolting the table, 66" high from the floor. The table travels 36" horizontally and adjusts 14" vertically. Belts about 31' long and any widths up to 10" may be used. The pulleys run in ball bearings. The machine is convenient for the operator and quick in operation. The spokes in the one wheel are guarded and on the other end the pulley is entirely enclosed in the exhaust hood. The table mentioned above rolls on ball bearings and not on ball bearing rollers. Reversible switch permits the belt to run in either direction. In general it might be said that the machine consists of three principal parts—the power stand, idler stand and the table. The table is fastened to the base plates of the stands, all carefully machined and mounted in perfect alignment and overhead the two stands are connected with a rigid bar or top stay. The sand pulleys run in ball bearings. The table is 96" long and 32" wide. For motor drive slow motor is directly connected to the driving pulley, pulleys being rubber faced, running at 600 r.p.m. These pulleys being very large in diameter make for longer life of the belts as the sand breaks off less than when going around a small pulley. The pulleys are 24" diameter by 10" face. High Speed motor may also be geared to the pulley.

Heavy Fire Loss at Huntsville

Fire recently destroyed the entire woodworking enterprises of the Muskoka Wood Mfg. Co., Limited, Huntsville, Ont. The blaze is believed to have originated from a smoker in an outhouse. A high wind was blowing at the time and the fire was not noticed until it had communicated with the dry kilns. The sawmill, woodworking factory, storage sheds, power plant and all other buildings were wiped out.

Fortunately the lumber escaped. R. J. Hutcheson, president and managing-director, reports that the loss is very heavy as they have between 4,000,000 and 5,000,000 feet of logs at the mill yet unsawn, about half of the logs being hardwood.

The Muskoka Wood Mfg. Co. have not yet decided what they will do in the future, but owing to the assistance of friends in the trade, they are taking care of all flooring orders. The insurance on the plant amounted to $162,500. The company have been successful financially, and if they decide to begin reconstruction, one of the most modern factories on the American continent will be carried out. The plant had been running steadily during the winter months and was behind in shipments of flooring, "Red Deer" brand flooring was turned by the company, and the product is well known from Coast to Coast.

The Muskoka Wood Mfg. Co., Limited, was organized in 1902 and erected a small sawmill and woodworking plant at Huntsville. During the first year thirty men were employed aind at the time of the fire two hundred and fifty were on the pay-roll. The business has grown steadily. The company cut in the sawmill about 6,000,000 feet and produced 3,000,000 to 5,000,000 feet of hardwood flooring each year. The Muskoka Wood Mfg Co. also turned out lath and had a dry kiln capacity for about 250,000 feet at one time, and storage room for 1,000,000 feet of flooring.

The sawmill and factory were equipped with up-to-date machinery and a large dressing in transit business was done for a number of lumber firms. The power plant was of solid brick construction 40 x 40 with Waterous boilers carrying 115 lbs. of steam and developing more than 600 h.p. The boiler house was equipped with a Robb Armstrong and one each Waterous high speed and Filer & Stowell Corliss engines. The latter had been installed recently and would develop 750 h.p. It was the intention of the company to install further boiler capacity.

At the time of the fire the company were engaged in erecting an extension to their flooring plant, about 80 x 150 feet, and the walls of this building were up as high as 12 feet.

The Muskoka Wood Mfg. Co. had five kilns, two forced-draught and three natural-draught kilns. The plant covered about fifteen acres and there was a piling ground for 10,000,000 feet of lumber. There are eight railway spurs on the property which has splendid booming grounds, docks, etc.

Sweep of the flames at Muskoka Wood Mfg. Co.

Do not blame the boy for all the faults caused by a saw which is worked without any tension.

Upholstering and Trimming

Deep Seat Type of Chair

Probably Most Luxurious Style of Upholstered Furniture—Frame Made Without Feet

The chair illustrated in Fig. 118 brings into our discussion of modern upholstering perhaps the most luxurious type in modern use. The deep spring upholstering of this seat does away entirely with chair feet and the chair rests directly upon the floor.

In addition to this feature, this chair is of unusually luxurious proportions which must be built up entirely in upholstering.

For this reason, the seat of the chair is double-stuffed, and a soft, stitched edge is provided above the wire of the spring edge, as shown in Fig. 119. The stitching of the edge is intended only to give shape to the edge, not hardness.

The next step is the upholstering of the arms, as shown in Fig. 120. These arms, as will be observed in the illustration of the finished chair, Fig. 124, serve only the purpose of elbow pads, but they are completely upholstered, because, when in use, the down cushion and soft, spring seat sinks with the weight of the occupant, exposing the inside of the arms. They must, therefore, be treated as if they were exposed at all times. Fig. 120 gives the appearance of the arms at this stage.

The next step is the springing up of the back, which has been thoroughly described in connection with other chairs. This is followed by the double-stuffing indicated in Fig. 121, with its soft, stitched edge. The purpose of this edge and double-stuffing is to bring the depth of the upholstering of the back to about equal the thickness of the down cushion, in other words, the frame and stitched edge combined should equal about four inches, and the down cushion should also be four inches, so that the entire back, as shown in Fig. 124, is about eight inches thick over all.

A soft coating of hair is laid over the entire back. This may be confined under a muslin covering or it may be kept in place by the down cushion, which, as shown in Fig. 123, can be sewn to the stitched edge, it having been first fitted and filled in the manner already described in connection with other chairs.

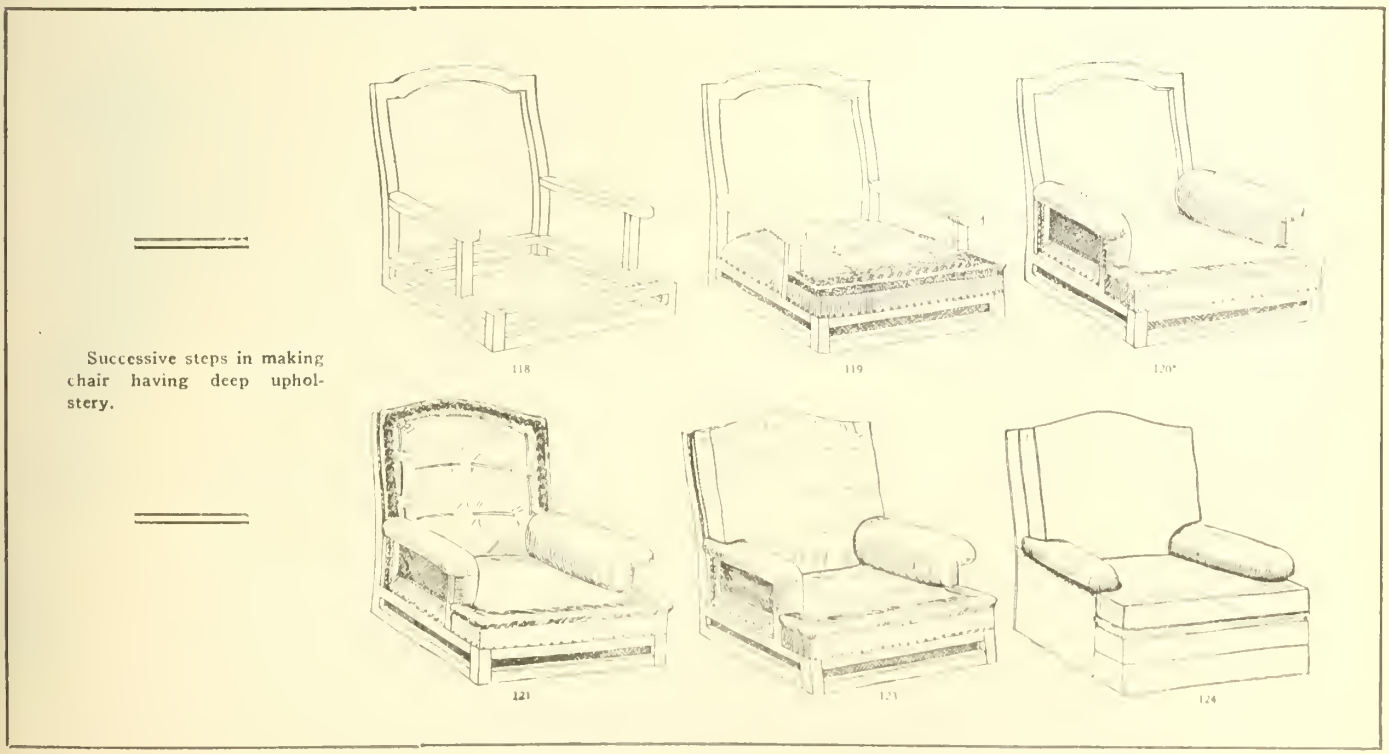
The completed chair, shown in Fig. 124, gives the appearance of the chair finished by welting. The luxurious character of the upholstering is suggested by its appearance of double and triple cushioning as well as by its unusual size.

(To be continued.)

Buying Burlap by the Pound

Many Interesting Questions Discussed at Recent Meeting of Upholsterers' Association

The National Association of Upholstered Furniture Manufacturers held a mass meeting in Chicago recently at which a number of unusually interesting topics were discussed. All subjects on the agenda



Successive steps in making chair having deep upholstery.

were frankly and fully thrashed out and in most cases definite conclusions were reached.

When the question of free samples of upholstering fabrics was brought up, it was recommended that all manufacturers of upholstered furniture confine their samples to pieces 6 in. x 6 in. If larger samples are required they are to be furnished to the dealers actual cost. It was brought out that many upholsterers are sending out samples as large as 24 inches square, which is a very costly method of promoting sales. President Gorrell, in reciting his experience, stated that 34 sample books recently made for customers cost him slightly in excess of $1,000., and that his records showed that for every $100,000. worth of merchandise sold the samples cost in the neighborhood of $1,000. From this it will be seen that the uncontrolled distribution of large samples costs the manufacturer a considerable sum each year.

Discourage Breaking of Complete Suites

Attention was also directed to the fact that manufacturers of cotton bats charge for the gross weight of the bales which means that the purchaser pays in many cases from 18 to 20 cents per pound for the burlap coverings. Definite action was not taken on this subject but it was the consensus of opinion that each manufacturer should, in purchasing cotton bats, specify that the net weight of the bale, after the covering had been deducted, would be the basis of settlement.

Members of the Association are to have their attention drawn to the question of making odd pieces to complete broken suites. One member present brought to the attention of the gathering the fact that as the appearance of pile goods changes rapidly when subjected to light, it was almost impossible to make an odd piece to match a broken suite on the dealer's floor even when covering taken from the same bolt is used. For this reason it was recommended that the manufacturers of upholstered furniture refuse to fill any broken suites and also that the manufacturers explain to their customers the necessity and advisibility of selling complete suites.

Should Not Present Conditions

D. D. Fennell, the executive secretary, in discussing general business conditions, attributed considerable of the present unsatisfactory state of affairs to the expansion of manufacturing facilities which took place during the period through which we recently passed. He pointed out that the normal increase of employment from 1899 to 1914 averaged 2.7%, while from 1914 to 1919 the yearly average increase was 5.3%, which is an increase of over 100% of normal. From this it will be seen that many who were not ordinarily wage earners were induced to enter the manufacturing field, so that to-day there are to be found plants and equipment able to produce upholstered goods far in excess of the normal demand. It was his opinion that upholstered furniture manufacturers should adjust themselves to present conditions rather than worry because conditions do not adjust themselves to their ideas as to what business would be.

In touching on the wage question, it was shown that in 1913 the average wage in the upholstering industry was less than 25 cents per hour, while to-day,

(Continued on page 98)

Woven Curled Hair

Also a Full Line of
LOOSE-CURLED HAIR
In All Grades and Colors

Samples Cheerfully Furnished

BLOCKSOM & COMPANY

Sterilized Curled Hair

MICHIGAN CITY, INDIANA

Eagle-Ottawa Leather Co.

TANNERS OF

FURNITURE LEATHER

OF EVERY DESCRIPTION

We are making a specialty of cutting

Spanish Split Leather for Chair Manufacturers

Quotations and samples furnished on application

We will be pleased to supply a very attractive sample book, of all our grades on application.

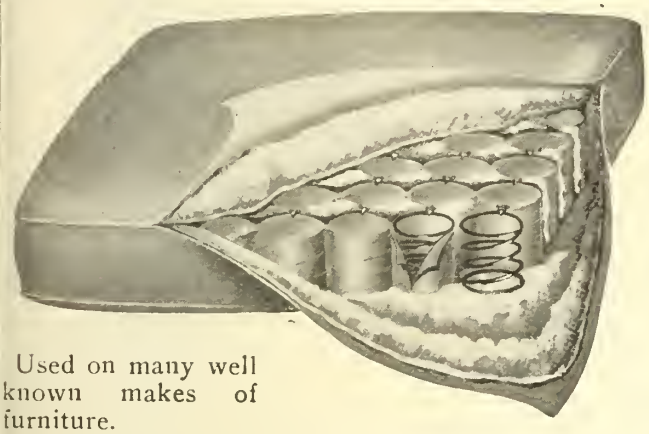
GRAND HAVEN - - - - - MICHIGAN

"COMFY" CUSHION COMPANY

Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.



Used on many well known makes of furniture.

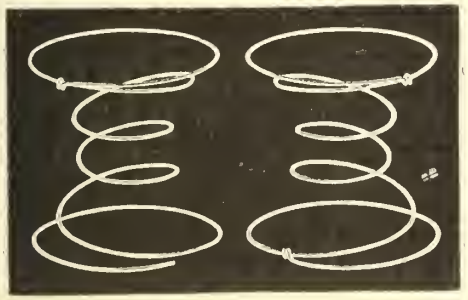
Write for Catalogue

"Comfy" Cushion Co.

340 Gerrard Street, East, TORONTO, Can.

"IDEAL"

FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,

of Canada, Limited

Windsor - Ontario

The

ORIENTAL TEXTILES COMPANY

LIMITED

Oshawa, Ontario

Manufacturers of

Upholstery
Mohair
and Velours

Agent

J. H. ALLEN

33 MELINDA STREET

TORONTO

Twines and Cordage

"Doon" Twines are known throughout the woodworking industry for their absolute dependability and uniform quality. They are entirely "made in Canada."

Spring Twines, Stitching Twines, Seaming Twines, Tufting Twines, Wrapping Twines, Flax, Hemp and Jute Twines for all purposes.

Write for samples and prices.

DOON TWINES, LTD.

Mills at Doon and Kitchener

Head Office: Kitchener

NEW Uniforming Stain

Did you ever hear of a stain that could be used on several kinds of wood in one job and produce a uniformly correct shade of mahogany?

We have produced such a stain. We have done the same thing in a walnut. And in each case the stain is as non-fading as a water stain.

Write for the facts.

The Marietta Paint and Color Co.

Marietta, Ohio

D&P

CURLED HAIR GLUE SANDPAPER

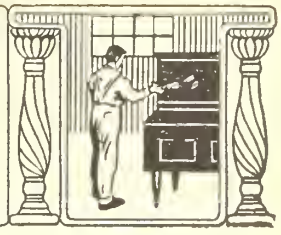
DELANY & PETTIT LIMITED

TORONTO.

OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC

THE FINISHING ROOM



Saving $22,000.00 in the Finishing Department

An Annual Saving of this Amount Has Been Effected in One Large Plant Through the Use of Varnish Drying Equipment

A stroll through the finishing rooms of several furniture factories is sufficient to convince one that many furniture manufacturers are alive to the advantages and savings made possible through the use of varnish drying kilns for the quick drying of varnish and other finishing materials. While some furniture men cling to the older and slower air-drying methods, many of the more progressive have kept abreast of the times and are enjoying the benefits and advantages of artificial drying. A comparison of the old and the new methods usually shows that where from twelve to sixteen days were required to finish a piece of high-grade furniture when all coats were air-dried, but six to eight days are necessary when resort is made to artificial drying.

Recently the Drying Systems Incorporated of Chicago, had a report made on the installation of Greeff varnish dryers in the Norwood, Ohio plant of the Globe-Wernicke Co. Extracts from the report show that an annual saving of $22,000. is being effected through the use of varnish drying kilns and that 350,000 pieces pass through the kilns each year at a cost slightly in excess of 2½ cents per piece. Some interesting extracts from this report follow:

Substantial Saving Shown

"Our Greeff system dryers have more than cut in half the time required to finish our furniture. This means that they have easily effected a 50 per cent reduction in floor space, saving $15,000 a year in rental, and have also reduced the amount of work in process of finishing by $100,000, saving $7,000 a year in interest charges. This gives us a total of $22,000 a year, making a return of 300 per cent on our investment," says George F. Kroeger, general superintendent of the Globe-Wernicke Company, Norwood, O.

"These dryers have the additional advantage of enabling us to carry most of our stock in white, which greatly reduces the risk we formerly assumed in anticipating which of our 20 to 24 different finishes would be ordered. Also by baking the filler hard, the dryers give the right foundation for the finish, and insure excellent results in the final coat. Since their installation we have had no trouble with sweating when we rub the final coat, and there is much less dust in the finish.

Natural Drying is Uncontrolled

"The finishing rooms had always been the most troublesome part of our plant, and the finishing process was always the one which held up production. We could control the production speed in all our other processes, but in finishing we were at the mercy of weather conditions, and production delays due to bad weather were very frequent.

"Following a visit to another furniture factory, where we found Greeff dryers successfully handling a process similar to ours, we decided that these dryers would supply the missing link in our manufacturing process.

"We installed one stain and filler dry room, and one varnish dry room early in 1915. Later that year we put in another stain and filler dry room and another varnish dry room. In the latter part of 1916 we installed one high temperature green enamel dry room for enamel work on our steel cabinets. The total floor area of the first four kilns is about 10,000 square feet.

Seven Day Schedule

"These four dry rooms are used for finishing wooden filing cabinets and bookcases, of which we are one of the largest manufacturers in the world. A dull rub job gets three coats; a polished finish gets four coats. We use a temperature of 110 degrees on the dry bulb and 80 degrees on the wet. Our schedules vary somewhat, but they average about as follows:

Monday—Stain, two hours in kiln.

Monday—Fill, eight hours in kiln (over night).

Tuesday—First coat varnish, six hours in kiln.

Wednesday—Second coat varnish, six hours in kiln.

Thursday—Third coat varnish, twelve hours in kiln.

Friday, Saturday, Sunday—Dry and set.

"We usually let the last coat dry for twelve hours to be sure it is hard, and then let it set for two days to get it acclimated. Thus every coat is thoroughly dried, insuring an excellent finish. The entire process takes approximately a week. For thirty years we dried our furniture in ordinary rooms, the complete process requiring from two or two and a half weeks. The process of introducing moisture with heat effects a big time saving and gives a better product.

Operating Cost Extremely Low

"Our steel work, which has an oak and mahogany finish, is dried in one of the varnish dry rooms, using a temperature between 140 degrees and 150 degrees, but the green enamel finish, which constitutes the larger part of our steel work, gets three coats, and is dried in the room especially designed for it. The process takes about three days. If we used the air drying system for our green enamel it would be impossible to use the kind of enamel now employed, because it would practically never dry. If we used an enamel which would dry in the air it would be at a sacrifice in quality.

"The cost of operating the dryers is very low. The installation of four stain, filler and varnish dry rooms amounted to $7,080.00, exclusive of the dry room housing, and the equipment is easily good for ten years. It takes only one man to handle the work

in and out of each dry room. A small amount of power is required for operating a connected load of fifteen horsepower. The only other expense is for the steam required for heating. As we used some steam under the old system this is not all additional expense.

"The total annual operating cost of the four dry rooms is $9,080.08. Working 300 days per year, the cost is $30.27 per day. Since we handle 350,000 pieces a year, the cost per piece is $.0259. Costs on the enamel drying room are not available."

While the Greeff varnish drying kilns are manufactured by the Drying System Inc., Chicago, their license permits them to sell only in the middle and western states and in Canada. The A. S. Nichols Co., of New York, produce their varnish drying under the same patents but their field is limited to the eastern states and eastern Canada, including Ontario.

Maintaining a Standard Finish

Requires Careful Attention to Shade and Tone to Maintain a Standard—Drying Schedule for High Class Finish—Use Only One Grade of Varnish

At different times the question of adopting recognized standard shades for the various finishes found in the furniture industry has been discussed and many arguments have been put forward in favor of certain definite standards being adopted. One of the chief objections, however, is that if some such move were made many lines would lose one of their distinguishing characteristics, viz., individuality in tones and finish. Often the finishng room foreman or the man responsible for the mixing of the stains and fillers will strike some new and unusually attractive shade or tone that will immediately find favor, resulting in an increased demand for that particular line. Special finishes of this nature have proved to be such efficient sales incentives that instances are not lacking where considerable sums of money have been offered for the "secret" of certain attractive shades. This advantage would be lost if standard finishes were to come into general use.

There is one branch of the furniture industry, however,—manufacturers of desks, filing cabinets and sectional bookcases,—which has adopted individual standards that are rigidly adhered to. This is absolutely necessary because a desk or section purchased to-day must often match up with furniture bought, perhaps, some years ago.

Not Easy to Maintain a Standard

A maintaining of a standard shade is not quite so easy a matter as one would think. It is so easy to lose a particular shade or tone especially when two or more men are working on it. This was the experience in the plant of the Office Specialty Mfg. Co., of Newmarket, Ont., when in 1919 and 1920 they were pushed to the limit to keep up with their orders. This unusual rush of business necessitated that the duty of maintaining the standard shades be delegated to three finishers. All were supplied with sample panels of the required shades and each one came very close to these standards, but when the output of one man was compared with that of one of the others, there was a marked difference in the strength of the finish. It was found that one was working just on the light side, another on the tone, while the third was just on the dark side. Comparing the output of each man with the sample, the difference was not noticeable to any but an experienced eye, but when the products of the light and dark men were compared the contrast was very marked.

The mixing of stains and fillers, especially in a case of this kind, is a one-man job, that is, the maintaining of any desired shade or tone should be left entirely to one man. Even when that is done, unless he is frequently called upon to work with that particular tone, his eye will soon lose its ability to hold the required shade. This even though he has a standard panel with which to work.

Use Combination Stain and Filler

At the present time the Office Specialty Co. are using a combination stain and filler on their oak line. This is dried in a Cutler varnish-drying kiln. The drying of the filler or foundation coat in this way results in a very satisfactory base being secured for the varnish coats. After the filler has been dried, a coat of white shellac is given, followed by three or four coats of varnish, depending on the quality of the finish desired. All desk tops are given a four-coat finish.

The varnish coats are artificially dried in a kiln having a dry bulb temperature of 90 degrees to 95 degrees, giving a relative humidity of about 35%. These are approximately the same conditions as are found in the panel-drying kiln. Under these circumstances there is no tendency for the veneers to check or the veneer joints to open in the varnish-drying kiln for the equilibrium moisture content of the conditions in the varnish-drying kiln is practically the same as the equilibrium moisture content of the veneer-drying kiln.

Drying Times for Varnish Coats.

The initial coats of varnish are given eight hours in the kiln and forty hours air drying before the next coat is applied. This means that each of the foundation coats are hard and dry before the next coat is spread on. The second last coat, however, is only given eight hours in the kiln before the final or rubbing coat is applied. The reason for this is that applying the finishing coat before the preceding coat is thoroughly dry, enables the two coats to knit together, practically making one heavy coat. This will withstand a lot of rubbing, such as is often found necessary to bring up a large surface like a desk top. If the first coat should happen to be rubbed through in spots, it will not be noticeable for the two coats are as one, whereas if the under-coat had been perfectly dry before the finishing coat was applied, each spot where the finishing coat was rubbed through would be plainly visible.

Another thing that has been standardized in the finishing department of this plant is the grade of varnish used. They use one grade, and that the best, for all lines and for all coats. This is as it should be for

the saving which may be effected by using cheaper varnish for either the under or finishing coats or both, is very small and is more than offset by the standard of the finish secured. As the finish goes a long way toward selling an article or a line, it would pay many manufacturers to change their policy and by buying better material, turn out a line with a finish that will give a satisfactory amount of service.

Enamels for Furniture Work

By Chas. V. Eddington.

The main feature of enamels for this class of work are uniformity in shade, brushing consistency, flowing, drying and rubbing. Of course, uniformity in shade is absolutely essential, as the furniture manufacturers require to turn out different pieces that will match in shade.

In the past it has been the custom for manufacturers of general lines of paints to endeavor to make furniture enamels, which will no doubt account for the unsatisfactory enamels which have at times offered to the furniture trade. These enamels require unusual care, and a knowledge of finishing room conditions in order to turn them out satisfactorily.

The pigment portion must be exceedingly fine, and the vehicle is a special varnish made for this class of goods that dries harder than the ordinary enamel vehicle.

As a rule three coats are used, namely: two of the undercoat and one of the enamel, although in some cases it will be found that the second coat will consist of a mixture of the undercoat and the enamel. In high class work four coats are generally used, namely: two of the undercoat and two of the enamel.

The enamel can be obtained in either satin or high gloss. the high gloss is a rubbing enamel, while the satin gives a rubber enamel effect and is intended for cheaper grade work. Both the undercoats and the enamels can be either brushed or sprayed, and can be used in a forced drying system with satisfactory results. They can be used on either wood or metal.

SELLING FORCE OF GOOD FINISH

It may stand every strength test, this table or chair,
May be built like a gunboat, for service and wear;
May be made from the finest of metal and wood,
Yet may lack one essential—and never make good.
Though its inner construction be sound as a bell—
If the finish be wrong, 'twill be harder to sell.
The design may be perfect, original, bold,
Its beauty and grace a delight to behold.
Or again, it may copy with scrupulous zeal
Some design on which genius of old placed its seal.
Neither form, nor affection for fashions antique
Will put over the sale—if the finish be weak.
Make sure of the finish you give it, say we,
And see how much better its "FINISH" will be.
—"Marietta Message."

Information and Inquiries

You are cordially invited to make use of this department

Clothes Pin Equipment

Sorel, P. Q.,
April 27th, 1922.

Editor, "Canadian Woodworker."

We would like to get some modern clothespin-making equipment and also a hub wheel machine, and thought perhaps that you might be able to tell us where this machinery might be secured.

Would also like to know where we can secure some rock elm at some point near Sorel.

Sincerely yours,
C. Boisvert & Sons.

Clothespin equipment may be secured from the following concerns:—The Humphrey Mfg. Co., Keene, N. H.; W. H. Smith Mfg. Co., Sunapee, N. H.; or the Goodspeed Machine Co., Winchendon, Mass. It is just possible that some of these manufacturers may make hub wheel machines. We are not in a position to give you any information with regard to the rock elm, which may be available near Sorel. Can you not make a few inquiries among sawmill men in your vicinity? If they do not cut this wood, they will, likely, be able to tell you the nearest point at which you can secure it.

Information on Estimating Course

St. John, N. B., May 8th, 1922.

Editor, "Canadian Woodworker."

Regarding the article in the April issue dealing

E. T. CARTER & CO.
84 FRONT STREET EAST
TORONTO

Dealers in

Fibro Products, Linters,
Reeds, Rattans, Waste.

Quality Guaranteed. Prompt Shipment

"ENAMELS"

Our business in both White and Old Ivory Enamels and Primers has trebled during the past year.

WHY?

They are the best on the market. If you are not using them, write for samples and prices.

The Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

with the new course on estimating by the Millwork Cost Bureau, of Chicago, I would like very much to take this course but do not happen to be a member or in the employ of a member. Can you tell me how I can secure this estimating course?

Sincerely yours,
H. C. Evans.

You might write the Millwork Cost Bureau, 605 N. Michigan Ave., Chicago, Ill., and see what they have to say with regard to sending you the course. We are of the opinion, however, that the distribution of this estimating course is confined entirely to members of the Bureau and their employees.

Cost System Wanted

Editor, "Canadian Woodworker,"

We are running a Sash and Door factory together with a retail lumber yard and would like to know of a system whereby we would have a better and more accurate knowledge of our production costs. However, it is not our intention to install an elaborate and costly cost keeping system. What we want is a system that would give us all the necessary information without requiring the services of extra clerical help. Will any of our subscribers who already have had such a system in operation let us know how this is run or where this could be bought?

Yours truly,
Latour et Dupuis, Incorporee
By R. M. Boisvert, Accountant.

Here is a chance to help a fellow woodworker, and at the same time assist in promoting cost knowledge. Send in an outline of the cost system you are using and describe its operations. It would be gratifying to be able to publish brief descriptions of several simple but practical systems in the July "Canadian Woodworker."

Calculating Speed of Pulleys

Joliette, P. Q.,
May 8th, 1922.

Editor, "Canadian Woodworker."

Can you give me the rule for calculating the size and speed of pulleys. Suppose I have a motor running at 1,800 R.P.M., with a 5-inch pulley and want to run a machine at 150 R. P. M., what size pulley would I require on the machine.

Sincerely yours,
R. T. Brazeau.

A pulley 60 inches in diameter, if driven by a 5-inch pulley on a motor running 1,800 R.P.M., will give you a speed of 150 R.P.M., which is what you require. The rule is the R.P.M. of the driver shaft divided by the desired R.P.M. of the shaft to be driven, and multiplied by the R.P.M. of the driver pulley. If you are figuring the other way, and had a shaft with a certain sized pulley upon it, which you wanted to drive at a certain speed from a shaft of a known speed, you would reverse the formula and work the other way.

If you have a large number of small articles to turn get the advice of our advertisers who specialize in turning machines as to whether they can make you an automatic lathe to turn them.

The wood finish that will not paper mark in shipment

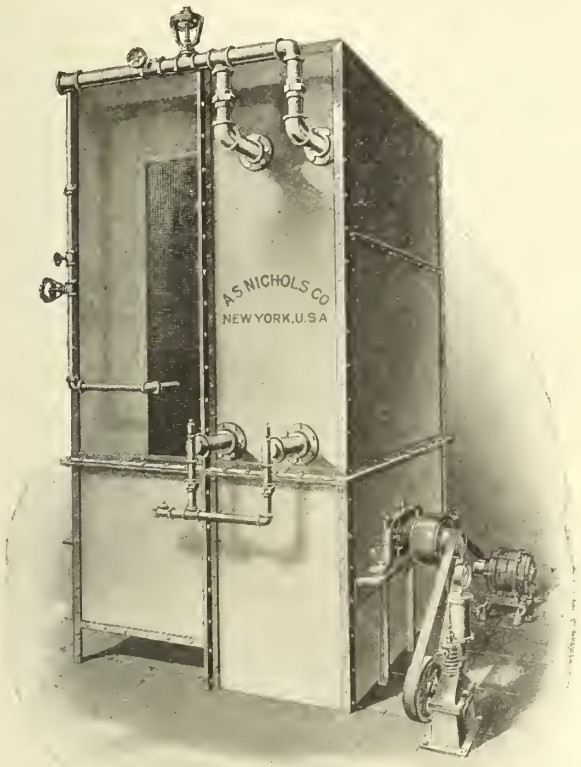
A product finished with ZAPONITE, the Pioneer Wood Lacquer, is proof against the harmful effects of paper marking when wrapped and packed for shipment.

Being extremely hard and uneffected by moisture, heat and climate changes, a ZAPONITE finish never gets "sticky," it never paper marks and it never shows the imprint of burlap wrappings—another reason why ZAPONITE is the ideal finish for quality products made from wood.

Let our Service Division help you to determine how ZAPONITE can be used in finishing your products at a SAVING in your production costs. Write us about this service TODAY.

Celluloid Zapon Company
200 Fifth Avenue, New York City
Branches: Chicago, New Haven, Los Angeles

THE PIONEER
ZAPONITE
WOOD LACQUER



Vertical Equipment Floor Space 4 x 6 ft.
Crated and shipped complete ready to set on the floor outside of your varnish room

Set Outside Your Varnish Room

The money a Nichols Paint and Varnish Dryer saves will pay for the equipment in one year.

This is not a wild statement but one we have proved time and again to manufacturers in practically every branch of the woodworking industry.

The Nichols Vertical Paint and Varnish Dryer is a complete unit of fan, motor, heaters, air compressor, with automatic humidity and temperature controls. A new rotary, humidifying air washer which eliminates all dust and dirt and does away with all spray heads, pump and connecting piping.

The equipment is manufactured in sizes suitable for all requirements.

Let us analyze your particular needs and quote prices on same.

A. S. NICHOLS COMPANY

Aeolian Hall

33 West 42nd St., New York City

Manufacturers of dryers for lumber, veneers, glued stock, varnish, paints, enamels, etc.

Increasing the Speed and Decreasing the Cost of Your Finishing Room Operation

How practical, how advantageous and how dependable DeVilbiss Spray-painting equipment is, has been demonstrated in finishing rooms of every size and line.

Not merely in dozens of finishing rooms, but in thousands of them. Not only where a few different kinds of articles are handled, but where every kind, size and grade of wood or metal product is finished. Not alone where varnishes, enamels or lacquers are used, but where every kind of liquid finishing material is applied. The

DeVilbiss

Spray-painting System

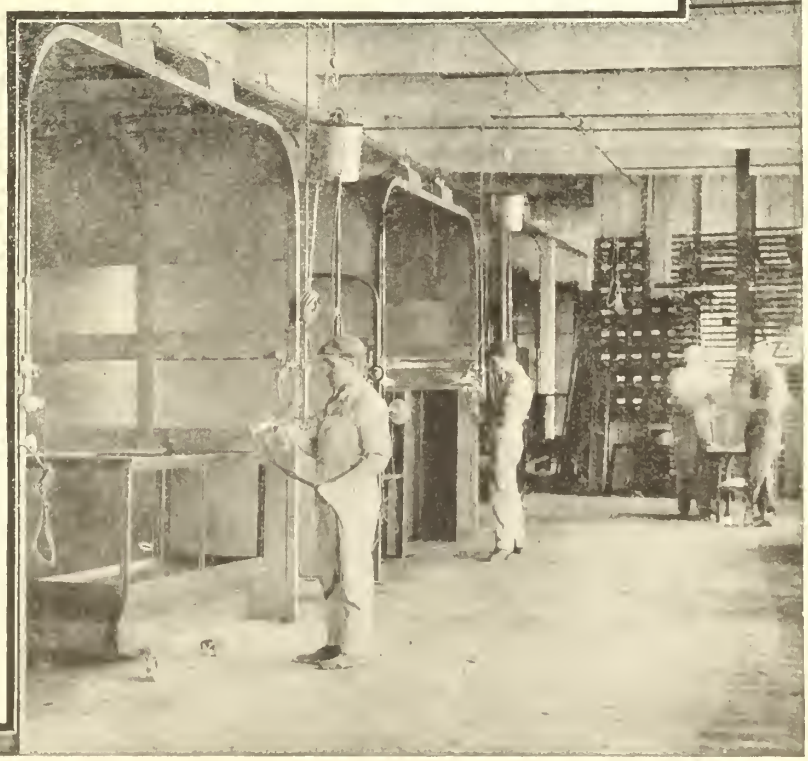
offers a complete, adaptable and guaranteed service. The finishing operation is speeded up 4 or 5 times over hand-brushing. A perfect, uniform coating is applied on all jobs. Working conditions are made more healthful and safer. Operating and upkeep costs are reduced to the minimum.

With your consent, we'll gladly tell you whether and how the DeVilbiss System can be of service and profit to you.

The DeVilbiss Mfg. Co.

3718 Detroit Ave. ***Toledo, O., U.S.A.***

Paint your factory walls faster and better with the DeVilbiss Spray-painting portable equipment. Let us explain.



FACE VALUE
A certain famous painting is valued at fifty thousand dollars, and there is much speculation as to whether it is worth the amount. The average man would not part with fifty thousand cents for its possession, its value as a thing of beauty is not apparent except to a few connoseurs.
The beauty of Birds Eye Veneer is unquestioned in the minds of both the unschooled and the educated. This beauty has a face value in the open market that none can dispute. Incorporated in your product it will add to the value of the piece in equal proportion as it enhances the beauty.
Use Birds Eye Veneers for beautiful furniture.
BeVeCo
VENEERS
BIRDS EYE VENEER COMPANY
ESCANABA MICHIGAN

Veneers and Panels

Glue Room Economy and Technology

Suggestions for Applying – Overheating or Prolonged Heating Weakens the Glue

By R. H. BOGUE*

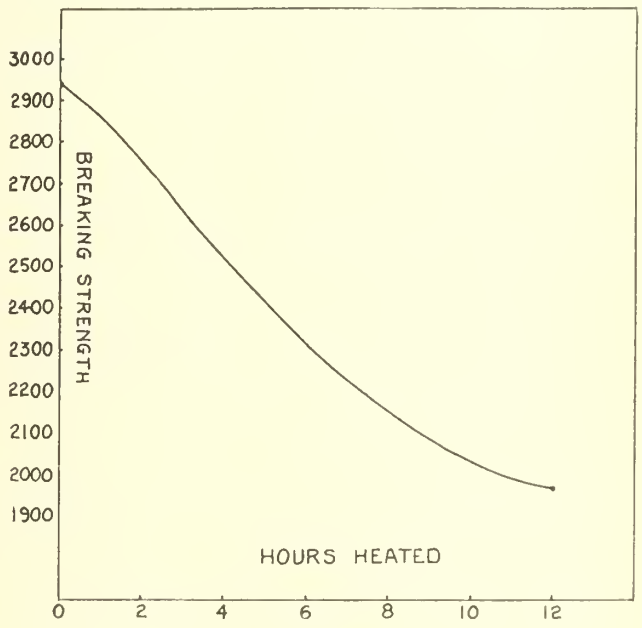
(Second of series)

After due consideration has been given to the concentration of the glue solution to be used for a certain work, the joiner must see to it that the joint is true, that the temperature of his glue is correct, that the temperature of the wood is correct, **i.e.**, warm but not hot; and then apply his glue quickly, rubbing it in as if he were painting it; apply the glue to both sections of wood in the joint; rub the joint to squeeze out as much of the excess glue as he can; and apply the pressure quickly and uniformly before the glue can have time to set. It has been shown that the most favorable pressure is about 200 pounds to the square inch of glued surface, but in practice only about 30 pounds are ordinarily employed. The joint should then be placed in a warm dry place and allowed to remain undisturbed for 8-12 hours. It is then safe to remove the pressure, but the maximum strength is not developed for several days.

Losses in Glue Due to Overheating

It was not many years ago that it was a common practice among joiners and cabinet makers to procure the highest quality of glue, and boil it down to obtain a particular consistency which was regarded as most desirable. They argued that in order to do the best work a glue must be of the highest grade, but that such glues, on the other hand, were too thick to spread well at the dilutions they regarded as necessary, and also chilled too thickly. It therefore became common practice to cook the material until it did possess the desired qualities.

A number of experiments have been performed in the writer's laboratory which illustrate very strikingly the decrease in strength which is brought about by the prolonged heating of a glue. Samples were made up in the usual way by the use of one part of glue to two and a half parts of water, and were heated for twelve hours in a water bath maintained at a temperature of 176 degrees F. All loss in water due to evaporation was made up each hour. At the beginning of the operation, and at the end of two, four, eight, and twelve hour periods, portions of the glue were removed and applied to maple blocks which had been very carefully surfaced, and the glued joints subjected to a uniform pressure of 200 pounds to the square inch by placing between the parallel plates of a universal testing machine. After sixteen hours they were removed, allowed to set for a week, and then carefully sawed to exactly four square inches glued surface, and sheared apart. The data obtained show very forcibly the serious loss due to prolonged heating, for the value of the glue dropped approximately one grade for each two hours of heating, or from the highest to the lowest hide grade in twelve hours. In actual figures the loss in strength averaged about 85 pounds per square inch per hour, or about 1,000 pounds per square inch in the twelve hours. Differently expressed, the loss in strength amounted to more than 5 per cent. of the original strength per hour of heating, or to 67 per cent. loss in the twelve hours. The curve expressing the decrease in strength is shown in Fig. 1.



Curve indicating how prolonged heating reduces glue strength

This is not an exceptional case, for many other investigators have found somewhat similar results. For example, Linder and Frost working at the somewhat lower temperature of 150 degrees F. (65.5 degrees C.) obtained a decrease in strength of from 30 to 45 per cent. on heating a glue for 20 hours. The United States Forest Service has conducted similar tests. Solutions of a high grade joint glue and a veneer glue were heated for 48 hours at 104, 140, and 176 degrees F. (40, 60, and 80 degrees C.) and tested every few hours during this period for strength and viscosity. "In the first 7 hours of heating at 176 degrees F., the veneer glue lost approximately one-half its joint strength, and the high grade glue joints weakened almost as much. The greatest loss in the strength of the glue joints occurred at this temperature. In the

*Industrial Fellow of the Mellon Institute of Industrial Research and Research Chemist for Armour & Co., Chicago.

This article represents a part of the section of the "Glue as an Adhesive" in the writer's forthcoming treatise on "The Chemistry and Technology of Gelatin and Glue," to be published by the McGraw Hill Company of New York in the Summer of 1922.

solution kept at 104 degrees there was a sudden drop in the strength of the joints made with the high grade glue after 31 hours of heating, due possibly to a combination of bacterial and chemical action. The veneer glue joints showed a more gradual decrease at this temperature. The most favorable of the three temperatures used was 140 degrees, but even at this temperature an appreciable weakening in both glues was noted at the end of 7 hours, and longer heating caused greater loss." The viscosity of the two glues decreased rapidly throughout the experiment.

Consider for a moment what these losses mean in dollars and cents. The price of the highest grade of glue is about 50 cents per pound, (in barrel lots), and the price of the grade to which it was brought by twelve hours of heating (in the writer's experiments) is 23 cents. That is, a loss of 27 cents per pound is sustained in twelve hours, or a little over two cents per pound per hour. The average loss per day of eight hours would, therefore, amount to about nine cents per pound. Let us carry the proposition to its conclusion. Suppose the amount of glue kept heated at all times is approximately a hundred gallons. That will represent perhaps 400 pounds of dry glue, and during the day the loss will become, therefore, 9 x 400 or $36.00. In the course of a year this rises to the surprising amount of twelve thousand six hundred dollars. Surely the prevention of such a loss is well worth a little time and thought.

Joints May Not Hold

Glue does not deteriorate by standing for 12-24 hours in cold water (unless an already putrid glue is used, or the temperature of the water is allowed to rise above 70 degrees F.). And glue that is properly soaked may be brought into a condition ready for use very quickly by merely raising the temperature to 140 degrees F., with stirring. There should be no difficulty experienced, therefore, in keeping the amount of glue actually in solution down to just above the quantity which will be immediately used, and so entirely eliminating any loss from prolonged heating.

Of even more serious importance than the foregoing is the possible failure of the joint which is made from the weakened glue. As was previously stated, the loss in strength amounted to about 67 per cent. of the original value. Assuming that the necessary strength was 2,500 pounds to the square inch, and that the glue was bought to carry 3,000 pounds to the square inch, thus giving a 500 pound margin of safety, any depreciation beyond this 500 pound margin would be disastrous. But, in the case cited, a six hour heating resulted in a 500 pound drop! The glue user has learned to buy upon a high margin of safety, and failures are not as common as might be expected, but when one does occur the user invariably concludes that he was sold an inferior glue, that the lot in question was not up to his previous buys,—that the glue manufacturer had "put one over" on him. Would it not be well for him to look rather to his glue-room?

May we not also properly ask why it should be necessary for the user to allow such a wide margin in strength for safety? The fact that he does is in itself an admission that his use of it is uncertain; that he does not at all times get his full value out of the material. Just as soon as he has learned to control his modus operandi to the end that he shall get the full value from his glue, just as soon may he in confidence and with safety cut down his strength margin to a narrower limit, and buy a less expensive glue, or apply his original glue at a greater dilution,—a procedure which will again save him many dollars on his glue bill in a year. The only reason, in fact, why glue failures under the conditions described are not many instead of few is that as the heating is in progress, so at the same time is evaporation taking place, and instead of an original fifty gallons there will be left after several hours heating only, perhaps, forty-five gallons.

(Concluded in July issue)

Veneering Under Ideal Conditions

Newmarket Plant Boasts Unusually Bright and Attractive Veneer Department—Special Kiln for Drying Veneers and Built-Up Work—Surroundings Have Effect on Output and Cost

The methods and equipment of the other fellow always afford an interesting study, not so much because of the ideas and information which may be picked up, but because to the practical man anything pertaining to his own particular line usually claims his attention. Let us then in imagination take a trip to the plant of the Office Specialty Mfg. Co., Newmarket, Ont. and visit the panel-making department. There are several features about this particular department which should appeal to the average woodworker.

Edge-Glue All Face Stock

Upon entering the veneer room of this plant the first impression is that of a large bright, well-ventilated department. The ceilings are high, the walls are almost a continuous sheet of glass, and every part of it is bright and clean. This in itself is unusual for so often the veneer room is stuck in some little-used or out-of-the-way portion of the factory building where both light and ventilation are bad. In this case the veneer department occupies the whole lower floor of one section of the plant.

At one time the Office Specialty Mfg. Co., Limited, purchased most of the built-up tops and plywood used in the production of their line of high-class desks and filing and sectional cabinets. This has all been changed. They have developed a well-equipped veneering department, and to-day are building up all their own plywood. The output of plywood is sufficient to take care of all the ordinary requirements of the plant, though several years ago when the demand for furniture was at its peak, they found it necessary to purchase some tops and panels.

The equipment of this department consists of a Perkins glue spreader for vegetable glue; a Jenkins veneer jointer, which, by the way, is supposed to be the first Jenkins jointer to be brought into Canada; a Black Bros. veneer taping machine, manufactured

(Continued on page 90)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

Buyers of Veneers and Panels

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in this publication. They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend his time and money to get in touch with you. He deserves it—if his stock and prices are right.

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.

(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

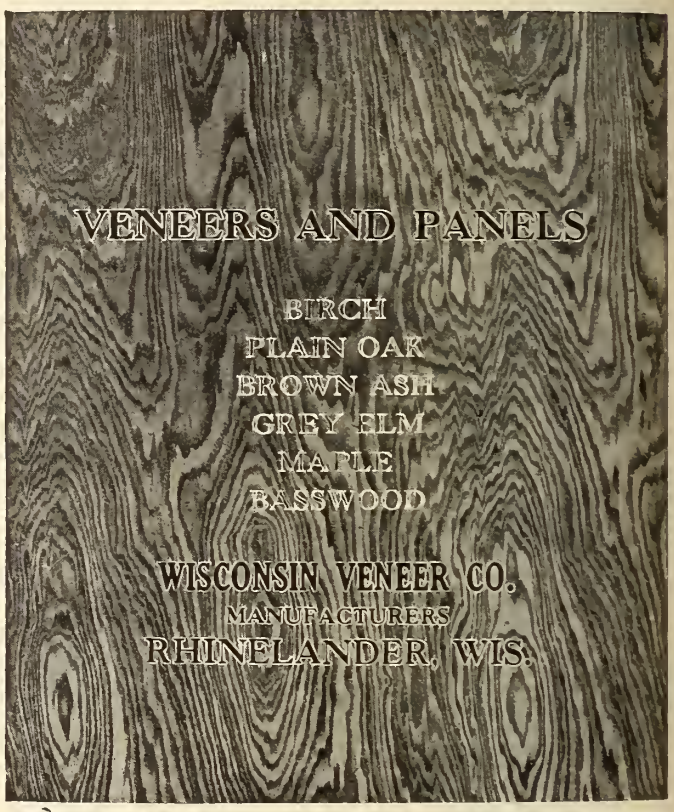
Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.



Litton Veneer Co.

Office and Mill Rockford, Illinois

Manufacturers

American Walnut Veneer and Lumber.

Plain and Figured Veneers of All Kinds.

Grand Rapids Office & Sample Room
192 Monroe Ave.
In charge of HUGH L. CURREN

J.W.Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers
Oak Lumber and Veneers
Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Poplar and Walnut Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND

HOFFMAN BROS. CO.

ESTABLISHED 1867 INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car	1/20′ Red Oak (log run)
½	Car	1/16′ Red Oak (log run)
½	Car	1/20′ White Oak (log run)
½	Car	1/16′ White Oak (log run)
1	Car	1/28′ Walnut (half round)
25M		1/28′ Poplar Crossbanding
5	Cars	1/8′ Poplar (log run)
2	Cars	1/8′ Poplar (corestock)

Prices by wire on receipt of your inquiry

HB

Reg. U.S. Pat. Off.

FORT WAYNE, IND.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

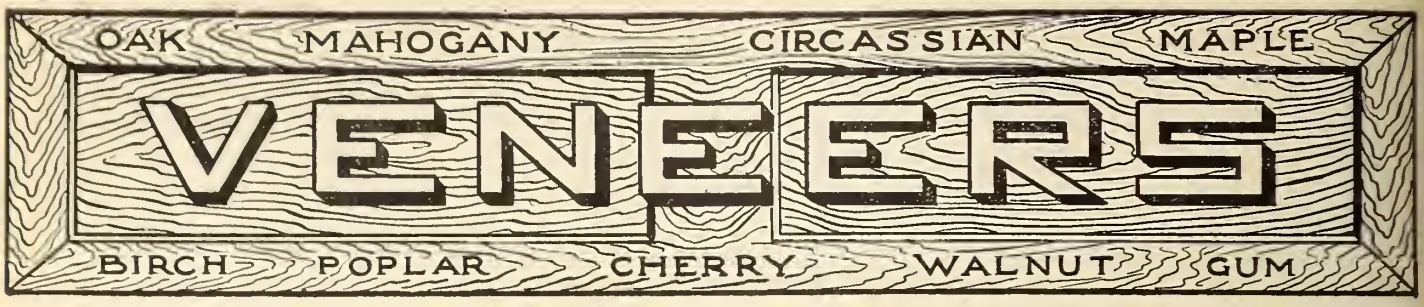
The Standard Veneer Co.
Portland, Maine

Wide Veneer

One carload of 1/20″ Quartered White Oak Sawed Veneer 12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

May we know your requirements early?

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

VENEER MANUFACTURERS COMPANY

VENEERS **PANELS**

The finest line of Figured Woods
Rotary Cut Veneers
Plywood Panels
in Chicago

Send for Samples of our Figured Woods

1036 W. 37th. St **Chicago, U. S. A.**

Subscribe for the
Canadian Woodworker
and
Furniture Manufacturer
Only $2.00 per year

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK
Years of Experience Behind Our Products
The Munising Woodenware Co.
MUNISING, MICH.

"Established 1884"

GUELPH PATENT CASK CO. Ltd.

Scotstown, Que.

QUALITY *SERVICE*

Our Veneers and Plywood are choice and we are fully equipped to supply the Canadian Trade.

Rotary cut Textile dried

We specialize in 1/4" and 3/16" three ply Birch Panels

Ontario Representative:
Frank Moss P. O. Box 356, **Toronto**

In our New York Sample-Rooms, which are typical of the Sales Branches. From a snap shot by R.W.W.

Quality Veneers

in

WALNUT BUTTS
MAHOGANY
LONG WALNUT
BURLS · OAK · POPLAR & OTHER WOODS

THE WILLIAMSON VENEER CO.

MILLS - BALTIMORE, MD.

Sales Branches: NEW YORK (709 SIXTH AVENUE) CHICAGO (28 E JACKSON BOULEVARD) HIGH POINT, N.C., JAMESTOWN, N.Y.

VIEWS OF OUR PLANT No. 11.

H.G.W.D.

BLACK WALNUT LUMBER

We offer the following

Band Sawn, Uniformly Steamed

Ready for Immediate Shipment

WALNUT		
55,000	ft. 1/2″	1s and 2s.
130,000	ft. 4/4″	"
100,000	ft. 5/4″	"
100,000	ft. 5/4″ & 5″	1st and 2s.
105,000	ft. 6/4″	1s and 2s.
115,000	ft. 8/4″	"
100,000	ft. 4/4″	Selects.
70,000	ft. 5/4″	"
45,000	ft. 6/4″	"
50,000	ft. 8/4″	"
200,000	ft. 4/4″	No. 1 Common.
100,000	ft. 5/4″	"
60,000	ft. 6/4″	"
25,000	ft. 8/4″	"
335,000	ft. 4/4″	No. 2 Common.
65,000	ft. 5/4″	"
15,000	ft. 6/4″	"
50,000	ft. 8/4″	"

Unexcelled Facilities for Kiln-Drying

WOOD-MOSAIC COMPANY

INCORPORATED

LOUISVILLE, KENTUCKY

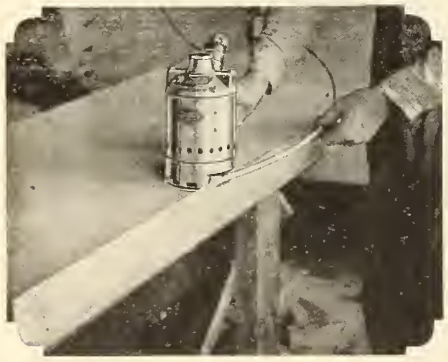
Veneering Under Ideal Conditions

(Continued from page 82)

by the Preston Woodworking Machinery Co.; a number of large sized screw presses; a C. M. C. belt sander; 2-trim saws; veneer clipper; warming oven and Cutler veneer and panel-drying kiln. A small auxiliary wood roller has been attached to the glue spreader in contact with the top glue roll. This is used for edge gluing the joints in the face veneers. Just before the face piece is run through the spreader, the tape joints are folded back and the edges run over this small wooden roll. This insures that a certain amount of glue is applied to the edges of the different pieces of veneer.

How Laying is Handled

In the laying of desk tops, which are built up on a heavy chestnut core, the oak tops are laid in one operation, that is, the crossbanding and face stock is glued at the same time. In the case of the mahogany tops, two operations are employed, the crossbanding being laid at one time and the face stock later on. The reason for this is that the heavy oak face veneer is thick enough to stand heavy sanding should the



Mattison edge veneer trimmer

crossbanding lap or buckle be used, whereas the thinner mahogany stock would be sanded through and the top ruined. The same procedure is followed in the case of five-ply oak and mahogany panels, the mahogany being laid in two operations.

After the tops have been veneered they are trimmed to size, standard wooden templates being used, and the end and edge veneers applied. This is done by hand clamps and special cauls or heavy strips. The next operation is trimming the edge stock. This is done with a Mattison edge veneer trimmer which is a small saw mounted horizontally on a small motor. This instrument does extremely smooth and accurate work as well as saving a lot of time. Formerly it took two men nearly fifteen minutes to clean off and smooth up the projecting edge veneers, but with the Mattison trimmers, one man can do the trick in about two minutes. The saving is obvious.

Veneer Dryer Kept Busy

As yet little mention has been made of the veneer and panel dryer. This is used for several purposes, such as drying the veneer, crossbanding and rotary cut core stock before laying, and for removing the glue moisture from the veneered tops and plywood. The wet and dry bulb temperatures carried are 90 degrees and 120 degrees, giving a relative humidity of 35%. The veneer and crossbanding, which is carefully piled with sticks between each sheet, is left in the kiln for 48 hours, which insures that it is thoroughly dry by the time the glue is applied. In drying the veneered stock the heavy tops remain in the kiln for 72 hours and the thinner stock for 48 hours. At the present time the purchase of a hot plate redryer for handling the thin stock and rotary cut core material is under consideration.

The matching of the veneers for the desk tops is an operation requiring a high degree of skill as well as artistic ability of no slight degree. A desk top with poorly matched veneers would not enhance the reputation of the producer. For this reason every attention is given to artistic matching. The work of the artisan responsible for this operation is made easier by the brightness and cleanliness of his surroundings.

Under conditions such as these, bright airy surroundings, good equipment and plenty of floor space, the workmen should have every incentive to produce a satisfactory volume of well-executed work, or, to put it in another way, the workmen should not have any reason for not producing a fair amount of work. In addition where conditions like these prevail, the production of high quality built-up work in a satisfactory volume should be secured at a comparatively low cost.

Quality Veneer in Demand

There is a growing tendency on the part of veneer users to buy their stock on a quality rather than a price basis. In years gone by veneer was veneer, and the manufacturer who could offer the cheapest product, usually got the business. The fallacy of this policy was soon discontinued with the result that there has been a growing demand for quality material, that is, for veneers which have been cut and graded carefully and which work up into a satisfactory product.

To insure that one secures the best obtainable, it is advisable to shop around a bit, dealing with the outstanding firms who emphasize value and quality rather than price. Take those advertising in this publication. They must have faith in their product or they would not spend good money to attract trade which they could not hold. It might be a good idea if those who buy their veneers from little-known concerns, would check over some of the advertisements found in this issue and see for themselves the quality of the stock carried by "Canadian Woodworker" advertisers. When a manufacturer is willing to stand behind his product, the purchaser does not take any great chances.

What is Mahogany?

Under the name of "mahogany" the wood of more than 60 different kinds of trees has at one time or another been marketed, according to the Forest Service, United States Department of Agriculture. Most of these woods come from the tropics, but sometimes even American birch and red gum are used in furniture and sold as genuine mahogany. For the benefit of those who wish to be able to identify the various kinds of woods likely to be called mahogany, the United States Department of Agriculture has issued a bulletin which tells how each may be distinguished.

Botanists class as "true mahogany" only trees of a single genus, called "Swietenia," of which 5 species are now known. True mahogany in this sense grows only in tropical America, from southern Florida and

General view of the C. L. Willey Company's Plant in Chicago, showing Main Factory Building, Warehouse, Yard Office, Storage Shed, and a Trainload of Logs on Switch Track.

Our Log Yard is constantly receiving supplies of Selected Logs from the Markets of the World. Our Size is the result of our Service—and we are just as ready to serve now, when growing bigger, as we were when growing big.

C. L. WILLEY COMPANY

The Largest Veneer Plant in the World

A PICTURE cannot adequately represent the size of our plant, the efficiency of our equipment, nor the variety of our stock.

A whole book full of pictures could not tell you of our Service.

As we have said before:

"Our world-wide organization—the broad experience of our men—our well established policy of fair dealing at every point of each transaction--these are some of the things that gives you assurance of satisfaction when you come to us for Veneer or Lumber."

C. L. Willey Company

2558 South Robey Street
CHICAGO, ILLINOIS

W. T. MOORE
110 Pearl St., Grand Rapids, Mich.

W. B. VAN
Everett Hotel, Jamestown, N. Y.

(1778)

northern Mexico to northern South America, including the West Indies. But the same region furnishes other woods which may take the trade name of mahogany, as may also various woods from Africa and the Philippines, some of which are rather near relatives of true mahogany.

Those who wish to tell for themselves what kind of tree a piece of "mahogany" actually came from will find in Bulletin No. 1050 of the United States Department of Agriculture, the Identification of True Mahogany, Certain So-Called Mahoganies, and Some Common Substitutes, by Arthur Koehler, specialist in wood structure of the Forest Service, a carefully constructed key and detailed descriptions of the properties and structures of a considerable number of species of woods which reach the American markets under this name. A hand magnifying glass and a piece of the wood which can be cut to show structure and color are all the equipments needed to apply the key.

British Development in Gramophone Design

The gramophone is, comparatively speaking, a modern invention, but the last few years have seen considerable progress made towards the perfection of the instrument so far as its mechanical properties are concerned. The advances which have been made in the design and construction of motors, sound boxes, etc., and in the records themselves make it possible to reproduce both vocal and instrumental music with great fidelity, and though further improvements are, of course, possible, it must be realized that a very great deal has been done in this direction, says a writer in the "Cabinet Maker." But as the gramophone has become more popular, so it has taken its place not only as a musical instrument but as an article of furniture, and it must be confessed that the same progress has not been made in the design and construction of gramophone cabinets as is apparent on the mechanical side. If the gramophone were merely a musical instrument like the cornet or the flute, and only on view while actually in use, its design and decoration would not call for any great thought, but, as has been said, the gramophone is tending more and more to take its place to-day as a permanent piece of furniture in the room, and for that reason it calls not only for mechanical perfection but also for beauty of design.

It is true that in the production of the better class gramophones good work has been done in providing, so far as the more expensive models are concerned, cabinets which harmonize with certain periods of of furnishing, but finality has certainly not been reached. The accompanying illustrations may be regarded as a genuine attempt to design and construct gramophone cabinets which shall be really attractive, carried out with a degree of artistry and craftsmanship only possible by placing quality first and foremost, the whole being still treated as a musical instrument of the gramophone type. The centre illustration, shows a cabinet designed and constructed in the Chippendale style in mahogany, with carved ornamentation. The panels are veneered with fancy mahogany, quartered, and the upper front panel is enclosed with a painted flower subject study after the painter Van Huisman, finished on a rich old gold background. The model on the right is in the style of Louis XV. the groundwork being painted and finished in an antique cream color with carved and silvered enrichments. The upper panel is decorated with a hand-painted miniature after Nattier, a Court painter of the Louis XV period, suspended in a caned panel. The lower panel contains a painted subject illustrating the dancing of the minuet; the side and back panels are decorated with scroll and floral ornament, ormolu mounted, finished like old silver. These mounts are reproduced from models by Cafferi. The third cabinet illustrated is also in the Louis XV style. The wood used is fine figured kingwood with quartered panels of rich padouk, fitted with two Vernis Martin panels painted on a gold background. These panels are reproduced from paintings by Boucher, the famous French decorative artist of this period. The cabinet is enriched with choice ormolu mounts. Apart from all these aesthetic considerations, the manufacture of such cabinets as these is doing at the present time a great deal of good in opening new fields of work for cabinet makers and others in allied trades.

Three examples of British gramophone design

TORONTO HARDWOOD LUMBER COMPANY LIMITED

(Formerly Lumber Dept., Toronto Veneer Co. Ltd.)

Head Office:
1100-1104 Queen St. W., TORONTO. Phone Park, 6980
Yard: Atlantic & Hanna Aves. Grand Trunk Ry. Toronto.

Montreal Office:
424 Power Bldg. Phone Main 8725
Saw-mill: Louisville, Ky.

Walnut	White Ash	Birch
Mahogany	Gum	Basswood
Yellow Poplar	Cottonwood	Beech
White Oak	Sycamore	Maple
Red Oak	Cypress	Elm
Chestnut	Yellow Pine	
	Tennessee Red Cedar	

Ample stocks of the above woods yarded in Toronto. Kiln-dried stocks shipped if desired.

Carload shipments made from our Band-mill at Louisville, where our manufacturing and yarding facilities are unexcelled.

If you are not receiving our monthly stock and price lists, please send us your name so that we may place you on our mailing list.

OUR SPECIALTY—INDIANA FORKED-LEAF WHITE OAK.

An unchanging high standard is your assurance of the utmost in Quality and Service when buying

PANELS LIMITED

Southampton - - - - Ontario

TOPS
CASE GOODS
FLUSH VENEER DOORS
3 AND 5 PLY PANELS
3 AND 4 PLY TABLE RIMS
5 PLY RIM BOUND TABLE TOPS

On hand for Immediate Shipment:
Stock Panels in Mahogany, Walnut, Oak, Birch, Etc.,

Sizes	24 x 60	30 x 60
	24 x 72	30 x 72

Selling Agents:

Toronto Veneer Co., Ltd. 1100-1104 Queen St. W. Toronto

Bending Southern Oak Chair Posts in Hot-Plate Bender

(Continued from page 56)

should be carefully dried down to 12 or 15 per cent. of moisture, with a view to obtaining normal shrinkage throughout the piece, and the material should be free of surface checks and honeycomb.

2. All posts to be bent together should be the same length.

3. They should be steamed at atmospheric pressure for not more than three-quarters of an hour.

4. They should be loaded into the steam plate bender and bent as quickly as possible—within three minutes at the most.

5. If possible the radial faces should come in contact with the plates while the post is being bent.

6. Enough compression parallel to the grain stress should be applied to bring the neutral zone on the convex side of the post.

7. The steam pressure in the plate should not exceed 20 pounds.

8. The posts should be dried down to a moisture content at equilibrium with shop conditions before they go to the shaper.

Prominent Furniture Manufacturer Passes

James E. Souter, Hamilton, Ont., for the past 22 years, general manager of Malcolm & Souter, Limited, furniture manufacturers died recently at his home in Hamilton, in his 57th year. Born in Aberdeenshire, Scotland, deceased was brought to Canada when three years old by his parents who settled on a farm near Burlington. In 1882 the family moved to Hamilton where the late Mr. Souter learned the trade of cabinet making. His advancement to the position he held before his death was the reward that generally attends conscientious effort. Besides being a successful business man Mr. Souter was an enthusiastic church worker and took a great interest in the welfare of the young people. He is survived by his wife, two daughters and one son. Two brothers also survive him A. M. and D. A. Souter, of the A. M. Souter Furniture Co., Hamilton.

Good Market for Shooks

Last year Mexico imported box shooks from U. S. manufacturers to the value of $2,000,000, and it is estimated that the figure will reach $2,500,000, during the present year. What is to prevent Canadian shook manufacturers, especially those in a position to make water shipments, from sharing in this trade?

The largest purchasers of wood box shooks are, probably, the various oil companies, acting through their purchasing agents. Among the purchasing agents for the largest buyers are Samuel Kamps, purchasing agent for the Pierce Oil Corporation, 25 Broad St., New York City; L. Carr, vice-president of the Anglo-Mexican Petroleum Co., 65 Broadway, New York. These companies are the largest users of boxes in Mexico. This does not, however, cover the whole field as manufacturers of soap, macaroni, vegetable oil, biscuits, candy, cigarettes, etc., use large quantities annually.

This photograph was taken of our exhibit at the Indianapolis Industrial Exposition held in Indianapolis last fall, which was attended by more than 150,000 people. Our exhibit was pronounced the finest display of Hardwoods and Veneers at the exposition.

WE HAVE THE FOLLOWING VENEERS READY FOR IMMEDIATE SHIPMENT:

1-20" Qt. Sawed White Oak
1-16" Qt. Sawed White Oak
1-8" Plain Sawed Red Oak
1-8" Cherry
1-8" Walnut
1-28" Walnut Sliced

2,000,000 Feet of Indiana Hardwood Lumber

F. M. BACHMAN CO., INDIANAPOLIS, IND.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

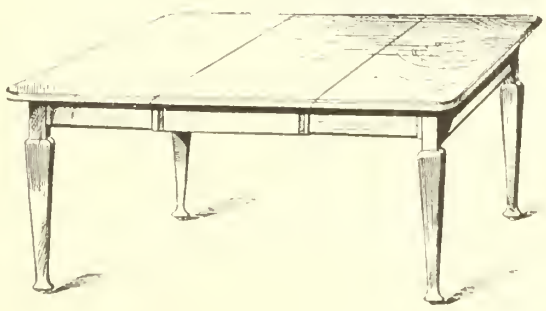
Prompt Delivery

LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

VENEERED TABLE TOPS
WALNUT - MAHOGANY - QUARTERED OAK

PROMPT delivery in any quantity at very attractive prices. Just let us know your requirements and we shall be glad to forward quotations.

Panels are made in Walnut, Quarter Oak, Birch, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.



HAY & CO., Limited Woodstock, Ont.

Credit Terms in Millwork Industry

(Continued from page 68)

have been accustomed to carry, both as to raw material and manufactured product. For these reasons, millwork manufacturers find they require more money and capital than ever before to carry on their operations. Hence, the urgent necessity of trying to curtail our outstandings by shortening the terms of sale, and thus reduce the book accounts from two hundred and two hundred and fifty per cent. of a month's business, to more nearly one hundred per cent. of a month's business, or perhaps even a trifle less. By co-operating in this matter, we will be releasing money or credit to be used in other directions.

What Discount Amounts to

It is high time that the cash discount is reduced to one per cent. and the selling terms shortened to thirty days net. Especially is this the case, because we are obliged to accept very largely such terms on the small part of our total volume of business which really can be discounted. A careful analysis of the "Sales Dollar" plainly shows that the millwork manufacturers should revise their selling terms to meet present changed conditions.

One thing is certain, it behooves everyone of us to discount our bills, even if we have to borrow money to do it. After all, most rates of discount allowed, no matter how small, generally earn a very fair interest rate. We are not fair to our Own Business when we fail to earn the cash discount for it. Nor are we Fair to the other man's business if we take a cash discount we have not earned.

Quoting the following discounts, with the annual interest rates to which they are equivalent, will tell you why.

½% 10 days—net 30 days is equal to 9% interest per annum.
1 % 10 days—net 30 days is equal to 18% interest per annum.
1½% 10 days—net 30 days is equal to 27% interest per annum.
2 % 10 days—net 60 days is equal to 14% interest per annum.
2 % 10 days—net 30 days is equal to 36% interest per annum.

I believe most manufacturers have now adopted the latter terms, 30 days net, 2% off for cash in ten days, which means we are allowing our customers a rate that is earning them 36% interest. So even if we reduced our cash discount to 1%, as recommended, we would still be allowing the trade a liberal rate of interest, equivalent to earning 18% per annum.

And when speaking of selling terms, much might also be said in favor of the Trade Acceptance, notwithstanding this method of settlement has been in ill-repute in sime quarters. The trade acceptance has been condemned recently because the instrument has been used in collecting past due accounts, which in many instances have been renewed. It has also been claimed that many trade acceptances have been returned unpaid. However, in considering the value of the trade acceptance, it is only fair and just that we compare it with other methods of settlement. We will, no doubt, all admit that during this present period of business depression, all methods of payments have been seriously abused.

Special Terms and Contract for Special Work

Thus far we have referred principally to the matter of terms in our relations with the jobber and dealer. Most of the membership of this Bureau is probably made up of manufacturers, who are largely interested in selling special or custom made millwork direct to the contractor or owner. It has been our experience that this class of trade should really be handled on a different basis. The very nature of these operations makes it well nigh impossible for the average contractor to discount his bills within the usual required time. So few contractors have sufficient capital to undertake the large jobs they frequently attempt to handle, that they are invariably dependent on the payment of monthly estimates to take care of their current bills. This procedure and the incident routine necessary, generally means delays which preclude any possibility of payments within the usual discounting period. It has been our practice, therefore, to always quote these jobs net thirty days. In order to take advantage of and secure the protection of the lien laws of most states, it is advisable not to quote terms beyond thirty days.

We also consider it essential to draw up contracts, covering this class of business, using our own regular printed form for this purpose. We dislike to use some of the so-called standard forms furnished by the architects or the contractors themselves. They invariably are ambiguous, and generally contain a number of clauses referring to sub-contracts, which really have no place in the contract of the party furnishing the millwork. Some of these paragraphs, in these general contract forms—were they not such a serious matter—might well be considered a joke. Only last week we were obliged to turn down a fair size contract offered us by an Indiana contractor, because his contract form contained any number of perfectly ridiculous propositions when applied to the millman in the general terms of a sub-contractor. One of these clauses even provided for pro rating elevator expense, also the insurance—fire, tornado and compensation insurance—among the sub-contractors on a basis proportinonal to the amount of their contracts. Surely items of this kind have no place in the contract of the millman. As stated, we returned this contract together with one of our blank forms, further outlining our ideas, and suggesting just what we think such a contract should cover. Thus far we have not heard from him. We have probably lost the business, but are just as well pleased. We know our competitors are going to do business and get their share of the trade, so we prefer they deal with this class of customers that seem to be a little obstreperous, and are inclined to have everything very much their own way. Most of us generally have enough grief and trouble without deliberately inviting it by signing some of these unreasonable contracts that are put before us. It is foolish to thus court or borrow trouble. We will gladly mail a copy of our contract to everyone who is sufficiently interested to apply for a form.

Much might also be said on the subject of a modified form of blanket bid, such as is used by many of the members among the larger mills, but I will refrain from any further remarks, since I have already taken up too much of your time and imposed on your good nature. For the purpose of discussion, therefore, I would suggest the following terms for the jobber and the dealer, namely: net thirty days, or 1% off for cash in ten days. For the contractor, terms of net thirty days.

The July "Canadian Woodworker" will contain an article by O. W. Brightman of the Green Bay Planing Mill, Green Bay, Wis., discussing Mr. Loetscher's address and outlining the views of the smaller planing mill operator.

Suggestions of Live Current Items

The usual famous Anderson-Tully service stands behind every foot of the following list of specials which we are pleased to offer the buying trade:

QUARTERED WHITE OAK

4/4 FAS 150,000

Full product of the log in this grade. Stock containing all of the 10" and wider produced, average 7½" for width, 45% to 55% 14' and 16' lengths.

4/4 No. 1 Com. & Selects .....150,000'

Full product of the log in this grade. 45% to 55% 14' and 16' lengths. Stock 8 to 12 months dry.

QUARTERED SYCAMORE

6/4 No. 1 Com. & Bet ..... 75,000'
5/4 No. 1 Com. & Bet. ..... 40,000'

Sycamore is beautifully figured stock, band sawn and equalized, 7 to 8 months dry. 55% to 60% 14' and 16' lengths. All wide in this stock.

LOCUST

4/4 Log Run .....One Car

SOUTHERN SOFT MAPLE

5/4 Log Run .....100,000'
(Worm holes no defects)
10/4 Log Run .....100,000'
(Worm holes no defects)

PLAIN RED OAK

5/4 Common & Select .....60,000'

PLAIN SAP GUM

5/8 FAS .....150,000'

PLAIN SYCAMORE

5/8 No. 2 Com. & Bet.....100,000'
6/4 No. 1 Com. & Bet. ..... 100,000'

Both items running 60% long lengths. Band sawn and equalized and 7 to 8 months dry.

HACKBERRY

5/4 No. 1 Com. & Bet. ..... 150,000'

Band sawn, thoroughly dry, and high grade in every particular.

HICKORY

8/4 No. 2 Com. & Bet. ..... 200,000'
6/4 No. 2 Com. & Bet. ..... 100,000'
10/4 No. 2 Com. & Bet. ..... 20,000'
12/4 No. 2 Com. & Bet. ..... 30,000'

WILLOW

We make a specialty of Willow in 4/4 to 8/4 thickness, and have a stock of this wood. We particularly want to move

4/4 No. 1 Common ..... 200,000'
5/4 FAS. ..... 40,000'
6/4 No. 1 Com. & Bet. ..... 100,000'
8/4 No. 1 Com. & Bet. ..... 50,000'

All of this stock thoroughly dry.

Discriminating buyers will find that it pays to be linked with an organization and service so truly founded on an understanding not only of the manufacture of lumber, but of its proper merchandizing and utilization.

ALL STOCK SIX MONTHS AND BETTER DRY

ANDERSON-TULLY COMPANY

MEMPHIS, TENNESSEE

ATCo (MEMPHIS) SOUTHERN HARDWOOD LUMBER & VENEER

Buying Burlap by the Pound

(Continued from page 72)

exclusive of the metropolitan districts, it is close to 40 cents per hour. Though wages are 90% higher to-day than in 1913, the price of upholstered furniture is only 42% above the 1913 level.

Well Planned Publicity

The Davenport Bed Makers of America then held a meeting. Discussion centred chiefly on the publicity campaign being put across by the davenport men. This is not a mere flash in the pan but a steady aggressive, well planned, advertising campaign which will bring customers into the dealer's stores for the next few years at least.

R. Branner, who is directing this campaign said; "There are five distinct elements that must be reached, and each is as important as the other. Starting with the manufacturer, he must help us to train his salesmen to sell service with davenport beds. The man on the road must not only sell the product of his house, but he must help to sell the goods when they are once in the dealer's store. He must endeavor to create a davenport bed expert in each store—a clerk who believes in the value of the piece, and who, because of this belief, will be able to impart it to his prospective customer. We must then help the dealer and keep him alive with sales suggestions, window cards, etc. We are doing this in our little magazine, Turnover, which will be sent each month to over 15,000 clerks and retailers, letters, letter inserts, etc. Then will come the clerk, and, as he is the final outlet to the customer, we must spend a large amount of time on his training. Finally we reach the customer who has been attracted to the store by our advertising and the dealer's window display."

Condition of Southern Sash and Door Industry

The response ai a number of suggestions submitted to the members of the Southern Sash, Door and Millwork Manufacturers Association by the secretary C. B. Harman, indicate that conditions are fairly good in that territory. The questions and replies are as follows:

	Good	Fair	Poor
How are orders with you now	22	33	6
How are enquiries with you now	35	23	3
What are prospects for business now and July 1st.	28	30	3
What are the prospects for the balance of the year	31	24	3
How are collections	8	37	15
Are you working full force	40 Yes		21 No
Are you working full time	50 Yes		11 No
Is money fair for construction purposes	41 Yes		18 No
Is your business what you would call normal	27 Yes		32 No

Develops Teamwork and Personal Interest

The stronger the co-operation between employers themselves and between the employees and the management, the less the confusion and fewer the broken promises. It creates a personal interest, develops teamwork and promotes the best interest of the company by having a better understanding of what to do if unforseen delays occur. It helps to meet competition, it cements the organization together and makes each department feel its part of the responsibility and to feel their ideas and suggestions are respected and appreciated, that each and every individual is a part of the great organization and has a hand in its growth and development.

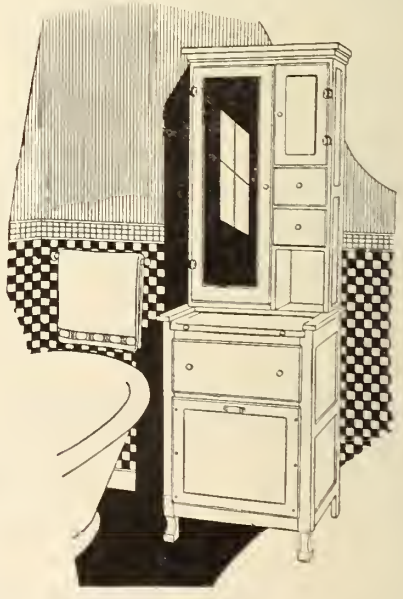
Co-operation between the different departments of an organization brings profits, the lack of it means loss. Teamwork gives greater impetus to business than anyone thing.

Hardwood Flooring Plants Busy

Hardwood flooring manufacturers are busy. Recently the head of a large concern stated all their plants were running to capacity and that one was operating both night and day. The prices on all lines are well maintained and there have been a few upward revisions of late. The present house-building campaign had resulted in a strong demand for birch, maple and oak flooring. The requisitions for the latter still lead, it being the most popular of all floorings for homes. A number of owners are, however, using birch and maple for upstairs and kitchen requirements. The speaker stated that special lines of hardwoods would be very scarce within the next two or three months and he predicted that there would be a decided shortage of maple in all grades, while the better ends of birch would be none too plentiful. Some export business is being done in hardwood flooring but not to any great extent.

Something New in Bathroom Furniture

A new piece of furniture for the bathroom, which has been placed on the American market recently, is shown in the accompanying illustration. This takes the form of a large bathroom cabinet and is in reality the application of the kitchen cabinet idea to bathroom requirements. As noted in the illustration, it consists of an upper and lower section, the upper being fitted with a large mirror and numerous small compartments which serve the following purposes.—medicine cabinet, shaving outfit compartment, toilet articles compartment, and provides space for various other



articles. The lower section, which is fitted with an extension, porcelain enamelled top, is provided with a large drawer for clean towels and a hamper for soiled towels and soiled linen.

While no dimensions are given, this would probably be from 26 to 30 inches wide and about 6 feet in height. When finished in white enamel it would make an attractive addition to any bathroom.

The method and character of our sticking is ne reason why our lumber is straight and flat"

DISCRIMINATING BUYERS

Now recognize the advantage of a dependable source of supply for their lumber and realize that quality, reliability and uniformity are the most important factors of cost.

These desirable features can only be supplied by the conscientious and reliable mill; they are beyond the control of the dealer, or middle-man, who must of necessity draw his supply from many different sources and can exercise no influence over the manufacture, handling or grading of the merchandise he sells.

Our lumber is properly graded; every board is plainly marked showing the grade for which it is shipped, and likewise bears our brand.

THE KRAETZER-CURED LUMBER CO.

We are manufacturers exclusively. Every board that we sell is the product of our own mills, and is manufactured, handled and piled with the greatest care; no expense is spared to obtain the best results; all our energies are directed toward producing a product that will yield maximum results to our patrons. The very highest quality in Gum, Oak, Ash and other Southern Hardwoods cut from virgin growth Delta timber.

KRAETZER-CURED GUMWOOD *Because:-*

. It is STRAIGHT and FLAT, free from the warp and twist usually encountered in untreated stock.

2. It is BRIGHT and will satisfactorily take any finish.

3. It is free from dote or rot—the sap and gums are eliminated by the steaming process and fermentation and decomposition are thus prevented.

4. Through the elimination of stain and decomposition, it possesses greater strength and longer life.

5. It contains only atmospheric moisture, enabling it to be used for many purposes without kiln drying.

6. When kiln drying is necessary, this can be done in much less time and with more satisfactory results.

7. It is uniform and dependable. One car like another, grade and measurement what it should be—no time wasted in reporting complaints or shortages, no delays or interference with factory schedules because of holding lumber for adjustments.

8. It is the most economical lumber available. It will satisfactorily answer any requirements expected of materially higher priced woods. Join our little army of satisfied users, and just as peace is about to supplant war, let peace of mind take the place of the warfare and worries that usually beset the user of lumber.

We're proud of this product that's why.

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE- GREENWOOD, MISS

Band Mills: Greenwood, Miss., Moorehead, Miss.

The Lumber Market

Domestic Woods

The general lumber situation, in spite of certain irregularities, continues to show some improvement from week to week. The trend of affairs is in the right direction and a larger volume of business is being offered with prices highly competitive. More inquiries are also being received as the season advances.

There are certain features which are more pertinent to the softwood market than to the hardwood. The extensive housebuilding campaign, which has been going on in various cities and larger towns, has brought forth a keen call for hemlock, white pine, yellow pine, fir, chestnut trim andhardwood flooring, but the general class of dwellings has not been such as to call forth the higher grades of hardwood; neither are there being erected many large office structures or industrial buildings that require in any large quantities the costlier woods for interior and exterior trim. This, along with a slackened industrial activity, has caused the hardwood lumber market to remain much quieter than the softwood situation. While a number of firms have contracts for bank and office buildings, there is not nearly as much going on in this line as two years ago.

Furniture factories are still quiet; phonograph plants, owing to the competition for radiophones, are not by any means busy, neither are agricultural implement factories, as farmers are not disposed to purchase any new equipment owing to the rather poor crops of last year and the low price they have been receiving for their produce and livestock. What sales are being made, are principally to the automobile plants some of which are rushed; in fact several concerns have had a record production and are buying the upper qualities of thick birch, maple and ash. Not a few Toronto wholesalers have sold considerable quantities of native hardwoods in Detroit and Michigan during the last few weeks but the prices have been rather low.

There is an abundance of No. 2 and 3 common in all kinds of hardwoods, which can scarcely be given away at the present time. All buyers are clamoring for the better grades and do not want to take the bitter with the sweet, so to speak.

Some export business is being done in end dried white maple and winter-sawn basswood. A number of carloads have gone forth recently to the Old Country, these woods being used principally in the construction of pianos. Manufacturers and distributors of hardwoods are still looking forward to a reduction in freight rates and believe that as soon as rail transportation shows a drop, there may be a corresponding decrease in ocean carrying charges. Although the latter were reduced some time ago, they are still far from being low enough to enable Canadian firms to compete with the timber merchants of the Scandinavian countries.

Manufacturers of hardwood stocks are still asking high prices, and a number of wholesalers refuse to buy, claiming that manufacturers are asking more than the wholesalers themselves can get for what they have on hand. Some dealers declare that certain lines of hardwood are going to be very scarce before many weeks elapse, and that native woods in certain grades and thicknesses will be practically unobtainable. One wholesaler stated recently that there would be no dry birch 5/4 and thicker in 1sts and 2nds and selects on the market within a few weeks, and a hardwood flooring manufacturer asserted that maple in No. 1 common and better would be exceptionally rare. Unless some new supplies are forthcoming, prices he said were liable to advance considerably, and no one desired a runaway market.

Imported Woods

Reports emanating from the different American hardwood-producing centres seem to indicate that the last few weeks have witnessed a marked strengthening in the demand for various items of American hardwoods. This is particularly true in the southern producing areas where flood conditions have reduced the output to 25% of normal, and where owing to the severity of the floods, it is freely predicted that in many plants production cannot be resumed for three to four months. These conditions are becoming more fully realized by the consuming interests, with the result that wood users are checking their stocks and requirements closely, paying particular attention to their needs in southern hardwoods. There has not been any startling change in prices although the better grades are showing a tendency to advance. The demand for what might be termed "furniture woods," including fancy veneers, is light. This condition is attributed partly to the midsummer lull which usually hits the furniture trade about this season, and to the influence and proximity of the midsummer markets. Should a satisfactory volume of business result from the furniture exhibits at Chicago, Grand Rapids and other manufacturing centres, it will mean a strengthing demand for hardwoods on the part of furniture makers. The distress stocks, which were thrown on the market on account of flood conditions, have been practically all absorbed. This is expected to have an influence on value in the northern markets. With the exception of furniture manufacturers, other industries using hardwoods of different kinds are showing an eagerness to cover for immediate requirements, some going to the length of placing orders for future deliveries. This may be taken as an indication of the fact that many wood users believe that higher prices are imminent. Another fact that points to the same conclusion is that with the idea of holding them for the better prices which they believe will prevail in the near future. If this tendency becomes general, it will have the effect of forcing prices upward, for with decreased offerings and an increased demand, higher values are inevitable. Summing up the situation, it would appear as if the volume of lumber business being transacted to-day is greater than that experienced at this time last year.

Catalog of Kiln and Yard Equipment

A unique catalogue in the shape of a file folder is being distributed by the National Dry Kiln Co., Indianapolis, Ind. This covers their line of dry kiln trucks, transfer cars and yard equipment of various types. The book is profusely illustrated with engravings showing the various types of truck and yard equipment which are manufactured by this company. When placed in the office file it will serve as a ready reference for anything pertaining to kiln trucks and similar equipment.

TURNER-FARBER-LOVE COMPANY

MANUFACTURERS

HARDWOOD LUMBER AND SLACK COOPERAGE

SUCCESSORS TO

DARNELL-LOVE LUMBER CO. LELAND, MISS.

RUSSE & BURGESS, INC. MEMPHIS, TENN.

LELAND STAVE & LUMBER CO. LELAND & CHICAGO

MEMPHIS, TENNESSEE

U.S.A.

The following is a list of unsold lumber on our yards, nearly all of which is dry and available for prompt shipment. We solicit your inquiries and orders, for straight or mixed car lots.

QUARTERED RED GUM

20,000	5/8"	FAS
12,000	3/4	"
15,000	4/4	"
30,000	5/4	"
18,000	6/4	"
100,000	8/4	"
50,000	5/8	No. 1 C&S
65,000	3/4	"
45,000	4/4	"
30,000	5/4	"
25,000	6/4	"
95,000	8/4	"

PLAIN RED GUM

10,000	3/8"	FAS
30,000	1/2	"
16,000	5/8	"
15,000	4/4	"
12,000	5/4	"
85,000	3/8	No. 1 C&S
112,000	1/2	"
60,000	5/8	"
60,000	3/4	"
30,000	4/4	"
12,000	5/4	"

PLAIN SAP GUM

30,000	1/2	FAS
50,000	5/8	"
20,000	3/4	"
15,000	4/4	"
18,000	5/4	"
60,000	6/4	"
75,000	5/8	" 13/17
75,000	4/4	" "
60,000	4/4	" 18/21
24,000	4/4	" 22/up
16,000	4/4	" 9/12" Box BDS.
120,000	4/4	" 3/17" " "
29,000	3/8	No. 1 C&S
50,000	1/2	"
100,000	5/8	"
30,000	4/4	"
20,000	1/2	No. 2 Com.
95,000	3/4	"
30,000	4/4	"
60,000	8/4	"

QUARTERED RED GUM (Sap No Defect)

50,000	5/8	FAS
50,000	3/4	"
16,000	4/4	"
60,000	5/4	"
95,000	6/4	"
60,000	8/4	"
50,000	10/4	"
20,000	5/8	No. 1 C&S
18,000	3/4	"
16,000	4/4	"
35,000	5/4	"
75,000	6/4	"
15,000	10/4	"

ELM

40,000	4/4	12 & Wdr. Cof. Bd.
36,000	4/4	Log Run
30,000	6/4	Log Run
16,000	4/4	No. 1 Com.
34,000	4/4	No. 2 Com.
19,000	6/4	"
24,000	8/4	"
60,000	10/4	"
10,000	12/4	"
17,000	1/4	No. 3 Com.
6,000	8/4	"
11,000	12/4	"

ASH

50,000	1/2	FAS
14,000	4/4	"
15,000	8/4	"
17,000	12/4	"
80,000	1/2	No. 1 C&S
33,080	4/4	"
10,000	5/4	"
10,000	6/4	"
17,000	8/4	"
10,000	10/4	"
30,000	12/4	"
18,000	4/4	No. 2 C&S
2,500	5/4	"
12,000	8/4	"
17,000	12/4	"
20,000	4/4	No. 3 Com.

QUARTERED WHITE OAK

10,000	1/2	FAS
25,000	5/8	"
22,000	3/4	"
20,000	4/4	"
22,000	1/4	No. 1 C&S
80,000	3/8	"
45,000	1/2	"
95,000	5/8	"
125,000	2/4	"
15,000	4/4	"
45,000	4/4	Strips
35,000	3/8	No. 2 Com.
50,000	5/8	"
50,000	3/4	"

PLAIN WHITE OAK

20,000	5/8	FAS
40,000	1/4	No. 1 C&S
105,000	3/8	"
90,000	1/2	"
110,000	5/8	"
60,000	3/4	"
30,000	4/4	"
50,000	1/2	No. 2 Com
112,000	5/8	"
50,000	3/4	"

PLAIN RED OAK

25,000	3/8	FAS
80,000	1/2	"
25,000	5/8	"
16,000	3/4	"
3,000	4/4	"
15,000	5/4	"
8,500	6/4	"
105,000	3/8	No. 1 C&S
125,000	5/8	"
80,000	1/2	"
120,000	3/4	"
20,000	1/4	"
6,000	5/4	"
4,000	6/4	"
4,000	8/4	"
105,000	3/8	No. 2 Com.
100,000	1/2	"
115,000	5/8	"
110,000	3/4	"
14,000	3/4	Soundy Wormy
125,000	4/4	"

PANTHERBURN CYPRESS

15,000	4/4	FAS
75,000	5/4	" 1 to 12"
12,000	6/4	" "
50,000	10/4	" "
60,000	12/4	" "
60,000	4/4	" 13 to 17"
40,000	5/4	" "
10,000	10/4	" "
35,000	4/4	" 18 up
24,000	5/4	" "
30,000	4/4	Selects
10,000	5/4	"
115,000	6/4	"
13,000	12/4	"
100,000	4/4	Shop
100,000	5/4	"
30,000	6/4	"
3,000	8/4	"
45,000	5/4	No. 1 Com.
125,000	6/4	"
15,000	4/4	No. 2 Com. Resawn
100,000	4/4	No. 2 Com.
20,000	5/4	"
15,000	8/4	"
150,000	4/4	Boxing
11,000	5/4	"
40,000	6/4	"
175,000	4/4	Pecky

MISCELLANEOUS

45,000	4/4	FAS Cottonwood 13 to 17"
11,000	4/4	Log Run Maple
12,000	6/4	Log Run Maple
80,000	6/4	Log Run Hickory
7,500	8/4	Log Run Hickory
30,000	6/4	No. 3 Com.
20,000	4/4	No. 1 C&B Black Gum
20,000	4/4	No. 2 C&B Qtd. Black Gum
12,000	4/4	No. 2 A & B Com. Pop.

CYPRESS SHINGLES

225,000	4"	Best
250,000	5"	"
175,000	6"	"
225,000	4"	Prime
250,000	5"	"
125,000	6"	"
250,000	4"	Economy
250,000	5"	"
125,000	6"	"

We also solicit your inquiries on Hardwoods, Cypress, Cypress Lath and Shingles. We have a good assortment and suggest that you buy now for your Spring requirements. We can ship mixed cars in thicknesses from 3/8 to 12/4"

It is understood that our stocks are constantly changing by reason of manufacture and shipment. We are prepared to surface one or two sides.

Sole Manufacturers PANTHER BURN Cypress

News of the Trade

The woodworking plant, dry sheds and storage sheds of Henry Swim, Doaktown, N. B., were recently damaged by fire with an estimated loss of $20,000.

The mill and factory of the General Lumber Co., Sherbrooke, Que., was recently damaged by fire. The loss is estimated at $35,000.

The Mengel Co., of Louisville, Ky., manufacturers of mahogany lumber and veneers, have acquired the plant of the J. S. Otis Mahogany Co., New Orleans. This will enable the Mengel Co. to improve the service they are rendering their clients, if that is possible. When taking over this plant they contracted to saw all the logs of the J. S. Otis Mahogany Co., but outside of this there is no connection between the two organizations.

The new factory of the Cranbrook Sash and Door Co., which has been erected in the city of Cranbrook, B. C. will be started up this summer, it is stated. Plant which was purchased from a mill at Golden has been brought down and properly placed in the new building, and shafting all lined up. Electric power will be used, satisfactory arrangements having been made with the city of Cranbrook. The main power unit will be of about a hundred horse power, but there has already been a smaller motor attached to a sorting table and a good deal of the cut from their mill at Kitchener has been brought in and stacked. Work has almost been completed in preparation for the electrical installation and further equipment for their plant is now reported on the way from the east. Their new factory has been erected on the site of the building destroyed by fire some years ago, but has been enlarged and put all under one roof.

R. S. Gourlay, of Gourlay, Winter & Leeming, Toronto, piano manufacturers, returned from Vancouver rrecently. It will be remembered that Mr. Gourlay was taken seriously ill some months ago while on a trip to the Coast and was forced to remain in Vancouver for fifteen weeks. His many friends will be glad to learn of his recovery.

Gill & Fortune, Lumber Co., Limited, Trenton, Ont., was recently incorporated with a capital of $3,000,000 to conduct a general lumber business manufacturing and dealing in all kinds of wood products. Two of the incorporators are W. H. Gill and O. E. Fortune, lumbermen, both of Trenton.

The saw and planing mill of O. P. Moxley, Dorchester, Ont., was given a close call by fire that started in one of the lumber piles. Quick work by a bucket brigade supplemented by a tower tank in the yards extinguished what might otherwise have been a very serious fire.

The ratepayers of Harriston, Ont., recently defeated a by-law to grant certain concessions and other inducements to the True Set Wheel Co., who contemplated opening a factory in that town.

The Ruddy Mfg. Co., Limited, Brantford, Ont., who recently took over the business formerly conducted by Ham Bros., are installing a battery of three 11-car Sidman lumber curing kilns. These kilns will be of concrete construction.

The new plant of the Milverton Furniture Co., Milverton, Ont., is about complete. They are working now on their battery of Sidman lumber curing kilns. This plant will be operated in connection with the B. & N. Planing Mill Co., an associate company.

Total fire losses in Ontario in the last four years have amounted to more than $50,000,000, according to statistics adduced from the records of the fire marshal. The cause of conflagrations causing almost a third of the total damage is unkown.

J. S. Boyd, contractor, 245 Jamieson Ave, E. Kildonan, Manitoba, has erected a wood working shop, to manufacture window and door frames and contemplates installing a table saw, and 5 h.p. motor.

A. Fridman, and J. Driben, have taken over premises at 12 Albert Street, Winnipeg, to manufacture store fixtures, and general cabinet work. Both Mr. Fridman and Mr. Driben were previously employed with the Meletone Talking Machine Co. Ltd., Winnipeg, for a period of five years. The trading name will be The General Cabinet Makers.

W. T. Cole, who for the past ten years has been sales manager of Seaman, Kent Co,. Limited, Toronto has resigned his position and in company with W. C. Gardiner, who lately disposed of his interest in the Builders' Moulding Co., Toronto, and others, will embark in the manufacture of hardwood flooring of all kinds. The new organization which will be incorporated, has taken over the old K. & S. rubber plant on Oak St., Weston. The property covers some five acres. The latest equipment will be installed and the firm will produce oak, maple, birch and beech flooring exclusively.

The planing mill of the Hocken Lumber Co., Limited, at West River, Ont., was recently destroyed by fire which broke out from some unknown cause while the plant was in operation. The mill was well equipped and the loss will be about $15,000., which is partly covered by insurance. A strong wind was blowing at the time but, fortunately, the excellent work of the men and the efficacy of the fire protection system of the company saved the adjoining piles, and the sawmill, which is about three hundred yards away. The Hocken Lumber Co., will rebuild their planing mill in the near future.

Myers Lumber & Mfg. Co., recently moved their offices from 15 Toronto St., Toronto, to the new office building just completed at their plant, corner of Spadina Road & Eglinton Ave, This new structure provides a number of private offices and a large general office. The plant of this company has been completed and is in operation.

Lake Temiskaming Boat Co., Limited, Haileybury, Ont., have been granted a provincial charter to manufacture and deal in all kinds of boats. Capital $40,000. A. L. Herbert and Edward Bucknail, both of Haileybury are two of the incorporators.

The Streetsville Lumber Co., Inc., who some time ago took over the plant of the Harris Wood Products Co., of Streetsville have opened up a retail lumber yard in that place. The company, which is under the management of Thomas Wedgewood, has recently erected a two storey frame building 40 x 108 in which doors, sash and other lines will be manufactured. The Streetsville Lumber Co., will make a specialty of turning out garage doors on a large scale. They also operate a planing mill and are carrying the usual lines of lumber, dimension, lath, shingles, posts, etc.

R. J. McKenzie, of Fredericton, N. B. was recently appointed head of mechanical subjects at the Carlton County Vocational School at Woodstock, N. B. Mr. McKenzie is succeeding Mr. Heckbert who resigned to go into the furniture manufacturing business being organized at Woodstock, N. B.

Peerless Box Co., Limited, Ottawa, have been granted a federal charter with a capital of $50,000 to manufacture and market all kinds of wooden boxes and cooperage stock. Two of the incorporators are M. H. McVeity and Dr. D. W. Wallace, both of Ottawa.

The Massey-Harris Co., Limited, Toronto, Ont., are planning on erecting a $250,000 plant at Pine Bluff, Ark., to manufacture stock for farming implements. This company have large holdings of timber in that territory, sufficient, it is estimated, to last for twenty-five years.

QUALITY **SERVICE**

In Canadian Hardwoods

Kind you want

Impressive quality

No better manufactured

No kick

On grades

Now is the time to order a sample car

THE

Kinnon Lumber Co.

LIMITED

145 King St. W. Toronto

NARROW BAND SAWS AND MACHINES FOR THEIR CARE

Our narrow band saws are made of the best Swedish steel and sharpened on the "Grip Feed" Filing Machine the latter of the most advanced design and construction. We specialize in these two items alone, with many years' experience back of us as our qualification to furnish as good a narrow band saw as there is on the market, together with the latest development in a saw-filing machine for the care of band saws.

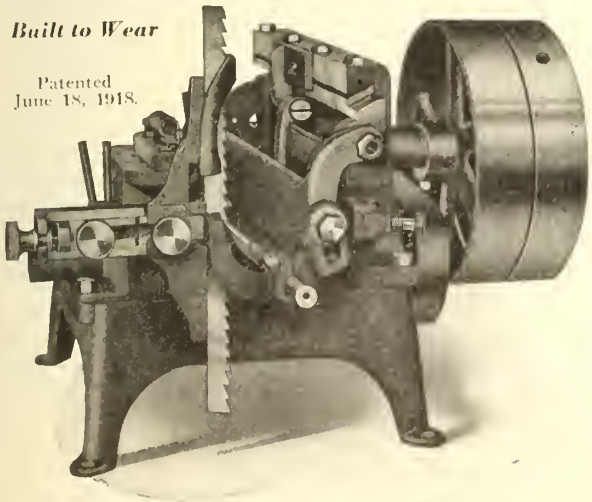
Send us your next order for narrow bands, also ask for particulars of the "Grip Feed" Filing Machine.

American Saw Filing Machine Co.

36 Washington St., N. Boston 14, Mass.

Built to Wear

Patented June 18, 1918.



The Peter Hay Knife Co., Ltd.

Manufacture the Best

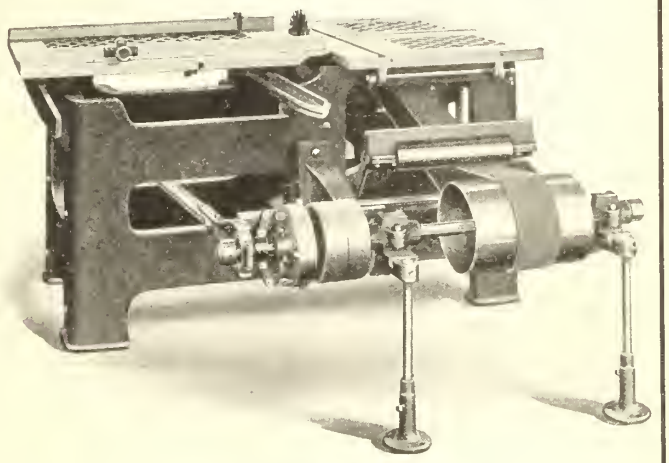
PLANER KNIVES and CUTTERS

OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited

GALT, ONTARIO

BEVEL AND MITRE SAW



No. 21 Bevel and Mitre Saw

Pettingell Bevel Saw finely suited to work on hard and soft wood for use in automobile, carriage, furniture, sash, door and all wood working factories.

WOOD-WORKING MACHINES.

No. 19 Small Saw Tenoner.
No. 20 Large Saw Tenoner.
No. 21 Regular Bevel and Mitre Saw.
No. 22 Large Bevel and Mitre Saw.
No. 23 8½-in. Irregular Dresser
No. 24 6-in. Irregular Dresser Stock Clamps.

Woodworking machines equipped with direct motor or belt drive.

METAL MACHINES

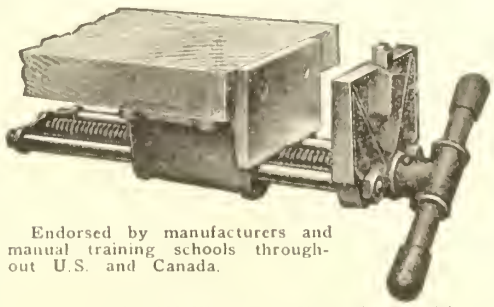
Large Automatic Power Hammers (For body panels and all other metal work.)
Small Automatic Power Hammers (For body panels and all other metal work.)
Metal Trimming Cutters
Rotary Cutters.
Metal Rollers or Formers.
Power Beaders. Foot Presses

Write for catalogue

PETTINGELL MACHINE COMPANY

AMESBURY - MASS.

Quick as a Cat - A Hold like a Bull Dog



Endorsed by manufacturers and manual training schools throughout U.S. and Canada.

No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

No. 430 Vise—Two Sizes with or without stop
UNEQUALLED FOR STRENGTH AND DURABILITY
Our Complete Catalogue on Request
RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.

The saw and planing mill of Robinson, Wright Co., Limited, Two Rivers, N. S. was rercently destroyed by fire, entailing a loss of $20,000. This plant will be rebuilt at once.

Allison Peck, of Hillsboro, Albert County, N. B., is contemplating erecting a woodworking factory in Moncton N. B.

G. W. Murray Co., Limited, Man., have been awarded the millwork contract for the woodwork for the new University of Saskatchewan building at Saskatoon, Sask.

Leon. Dion, Thetford Mines, P. Q., has commenced work on a new sash and door factory.

Hillsboro Woodworking Co., Hillsboro, N. B., have secured the contract for the interior woodwork for ten residences in Moncton.

King Phonograph Co., Limited, Toronto, were recently incorporated with a capital of $300,000 to manufacture and market phonographs, pianos, cabinets and other musical instruments. Among the incorporators are A. W. Holmested and A. B. Mortimer, barristers, Toronto.

The sash and door factory of Ovila Lanouette, Laurierville, Que., was recently destroyed by fire. The owner plans on rebuilding at once.

The Sweeny Cooperage Co., Victoria, B. C., has started a publicity campaign in an effort to educate the prairie and eastern markets to a proper appreciation of the value of Douglas Fir as a material for barrel staves.

Ginsberg Motor Co., Ltd., Montreal, have been granted a federal charter to manufacture automoblie bodies, aeroplanes, boats and other craft. Capital $500,000. Two of the incorporators are P. Bercovitch and R. L. Calder, solicitors, both of Montreal.

The Canadian Match Co., Pembroke, Ont., recently placed notices in their factory that beginning July 1st. the employees will get Saturday afternoon off and all legal holidays with full pay. provided the men work earnestly during the week.

Simplex Products, Limited, Toronto, were recently granted a provincial charter to manufacture and deal in woodworking tools of all kinds. Capital $250,000. C. B. Nasmith and R. Fennell, solicitors, both of Toronto are two of the incorporators.

The David Davies Cooperage plant at Waterdown, Ont., was recently damaged by fire.

Radio Laboratories, Limited, Toronto, were recently granted incorporation with a capital of $250,000 to manufacture and sell radio apparatus. E. A. Harris and L. M.Keachie barristers both of Toronto, are two of the incorporators.

What is said to be a record order was recently placed with the National Dry Kiln Co., of Indianapolis, Ind., by the Ford Motor Co., of Detroit. The material called for in this order will require 66 cars to carry it to its destination.

McEachren Planing Mills, Alvinston, Ont., have been awarded a contract for the erection of a school at a cost of $25,000.

A. R. McDiarmid Co., Limited, Brandon, Man., have been awarded a contract for the millwork for the school being erected at St. James, Man., at a cost of $96,000.

Traversy, Limited, Montreal, P. Q., have secured the contract for the sash and frames for the new $8,000,000, Mt. Royal Hotel, Which is being erected at Montreal.

The Empire Sash & Door Factory, Winnipeg, Man., was partly destroyed by fire recently.

F. H. Plant, Limited, Ottawa, carriage manufacturer recently commenced work on a new factory building, two storeys, 33 x 199, which will cost in the neighborhood of $30,000.

Jewett Radio Phonographs Limited, Windsor, Ont., were recently granted a provincial charter to manufacture and market pianos, phonographs, and wireless telephone equipment. Capital $1,000,000. A. B. Mortimer, barrister, of Toronto, is among the incorporators.

Radio Devices, Limited, Gananoque, Ont., were recently incorporated with a capital of $40,000 to manufacture and sell all kinds of radio equipment. K. Staebler and J. J. Davis, both of Gananoque, Ont., are two of the incorporators.

A fire which rapidly assumed serious proportions, destroyed the entire plant of the Muskoka Wood Mfg. Co., Limited, Huntsville, Ont. The sawmill, hardwood flooring factory, dry kiln warehouse and general offices all fell a prey to the flames.

The woodworking factory of Odilon Giguere, St. Joseph, P. Q., was recently destroyed by fire, entailing a loss of $8,000.

The Ottawa Car Mfg. Co., Limited, Ottawa, Ont., are remodelling their dry kiln into a "National."

W. J. Trick & Co., Limited, Oshawa, Ont., recently installed an Eaglesfield beltless swing saw. This line is being manufactured in Canada by the Preston Woodworking Machinery Co., Preston, Ont.

Canadian Wood Cement Co., Inc., Acton Vale, Que., was recenty incorporated to take over the business of Arthur Pierre Beaupre and to manufacture and market cements and glue for use in the woodworking industry. Capital $20,000. A. P. Beaupre and Victor Martineau, both of Montreal, are two of the incorporators.

Chas. Pennington, secretary of the Valley City Seating Co., Limited, Dundas, Ont., recently delivered an address at a Board of Trade luncheon, in Dundas, in which he outlined the growth of that firm and described some of the lines manufactured. This company is supposed to have made the first circular church pews to be produced in Canada. This was about thirty years ago. The lines manufactured include furniture for lodges, churches, assembly halls, wood carving of various kinds and other forms of woodwork. These products have been widely distributed, shipments being made to all parts of Canada, and in addition, orders have been received from Newfoundland, South Africa, United States and even Jerusalem.

"The Stuff That Counts"

The test of a man is the fight he makes;
The grit that he daily shows;
The way he stands on his feet and takes
Fate's numerous bumps and blows.
A Coward can smile when there's naught to fear;
When nothing his progress bars;
But it takes a man to stand up and cheer
While some other fellow stars.
It isn't victory, after all,
But the fight that a brother makes;
The man who, driven against the wall,
Still stands up erect and takes
The blows of fate with his head held high —
Bleeding, and bruised and pale—
Is the man who'll win in the by and by,
For he isn't afraid to fail.
It's the bumps you get, and the jolts you get,
And the shocks that your courage stands;
The hours of sorrow and vain regrets;
The prize that escapes your hands;
That tests your mettle and prove your worth,
It isn't the blows you deal,
That show if your stuff is real,
But the blows you take on the good old earth,

The Sidman Lumber Curing Process

IN

Remodeled or new, Wood, Brick or **Concrete** Buildings.

Fillers and glazes to preserve the building.

The TAG-ROESCH **Automatic** Time-Temperature and **Humidity Controller.**

Three-ply and Du-o-fold Army Duck Curtains, and Hussey Door Carrier Doors.

Automatic Heating, Ventilating and Humidity Systems for Varnish Rooms.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Sidmans AUTOMATIC **Suction System** for returning ALL Condensation DIRECT to the Boiler.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-Down Draught Vent Heads for all purposes.

Cleanable Screen Panel and Window Ventilators.

Roller Bearing (Ott) **Channel Iron** Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and The Sidman Special Hygrometers.

For Description and prices, write

The

Sidmans of Canada

Heating and Ventilating Engineers and Lumber Curing Specialists

LONDON **ONTARIO**

"A Birch Column is a thing of beauty when made up of Beautiful Birch

as below:

4	cars	4/4"	No. 1 Com. &	Btr.
1	"	5/4"	"	"
2	"	6/4"	"	"
2	"	8/4"	"	"
1	"	10/4"	"	"
2	"	12/4"	"	"
1	"	16/4"	"	"

Product from best Birch Section in Ontario.

Well Seasoned."

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 203 McGill Bldg.

Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Band Resaw, Connell & Dengler, 54 and 60".
Band Rip Saw, Yates No. 281
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 44 in. heavy type.
Dowel Machine, Hayes
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.
Jointer, Falls Machine Co., undercut 24 in.,
Jointers, 12", 16" and 24"
Jointer, Diehl Continuuous Feed
Lathe, Back Knife Clement 40 in.
Moulder, Hermance 8 and 10 in., 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 7" and 10", 4 side.
Matcher, American No. 229 fast feed hardwood flooring.
Planers, all sizes, single and double
Sander, endless bed 48 in., H. B. Smith.
Sander, Moore Machine Co., belt.
Sanders, Berlin 36", 42", 48" and 60"
Saw, mitre, double end Maddox.

Woodworking Machinery Company of Buffalo, 54 Mechanic St., Buffalo, N.Y.
1 T.f.

Machinery for Sale

One single Tenoning Machine
One Two Spindle Shaper
One Single Spindle Routing and Dovetailing
One Universal Sander
One Surface Oak Printing Machine
One Sawmill Carriage and Saw Frame in good condition.
One Electric Motor—35 Horse Power This has only been run one month.
One Electric Motor—50Horse Power This has only been run one month.
All the above are second hand—and as good as new. Ask for particulars. National Table Co. Limited, Owen Sound, Ontario. 6-8

OPPORTUNITY

For an individual or organization to lease or acquire a woodworking plant in Ontario equipped for manufacturing millwork, flooring, sash and doors. This plant could be readily adapted to the manufacture of other lines, such as furniture, general woodwork, refrigerators or cabinet work.

Favorable labor conditions, low insurance and taxes, steam and Hydro power, lake and rail shipments. town.

Operating capital only required, in which town and advertiser will assist in raising, apply Box 136 Canadian Woodworker, Toronto. 6

FOR SALE

The following items of Southern Hardwoods are on hand at our Little Rock mill for prompt shipment. This is our own manufacture-band sawn stock, dry, good widths and excellent lengths, graded strictly according to National Hardwood Lumber Association rules. Write or wire our expense for quotation.

1 Car 4/4" x 10 & Wider FAS Qr. W. O.
1 Car 5/4" FAS Qr. W. O.
½ Car 8/4" No. 1 Com. White Oak
2 Car 8/4" FAS Plain Sap Gum
2 Car 8/4" No. 1 Com. Sap Gum
3 Car 5/4" FAS Quartered Sap
1 Car 6/4" FAS Quartered Sap
20 Car 8/4" FAS Quartered Sap
½ Car 12/4" No. 1 Com Qtrd. Sap
1 Car 6/4" No. 1 Com. Plain Red Gum
1 Car 4/4" FAS Quartered Red Gum
2 Car 4/4" No. 1 Com Qtrd. Red Gum
3 Car 5/4" FAS Qtrd. Red Gum
3 Car 5/4" No. 1 Com. Qtrd. Red Gum
3 Car 6/4" FAS Qtrd. Red Gum
6 Car 6/4" No. 1 Com. Qtrd. Red Gum
5 Car 8/4" FAS Qrtd. Red Gum
11 Car 8/4" No. 1 Com. Qrtd. Red Gum
½ Car 10/4" No. 1 Com. Qrtd. Red Gum
1 Car 12/4" FAS Qrtd. Red Gum
1 Car 12/4" No. 1 Com. Qrtd. Red Gum
2 Car 4/4" FAS Qrtd. Fig. Red Gum
1 Car 5/4" FAS Qrtd. Fig. Red Gum
1 Car 6/4" FAS Qrtd. Fig. Red Gum
1 Car 8/4" FAS Qrtd. Fig. Red Gum
1 Car 4/3" No. 1 Com. Qrtd. Fig. Red Gum
1 Car 5/4" FAS Plain Fig. Red Gum

E. L. BRUCE COMPANY,
Memphis, Tennessee, U. S. A.
Band Mill, Little Rock, Arkansas.
Flooring plants, Little Rock, Arkansas, Memphis, Tennessee. 6

USED MACHINERY

For Quick Sale

1—30" Double Surfacer.
1—26" Double Surfacer.
1—24" Double Surfacer.

Above machines equipped with two-knife square cylinders, sectional rolls, flexible chip breakers, countershafts. Special price for quick sale.

Colladay Machine Works, Manufacturers of Woodworking Machinery, 626 Race St., Philadelphia, Pa. T.f.

WANTED

A good handy sticker hand, must be able to make his own set ups. Steady job. State wages expected. Apply HILL CLARK FRANCIS Limited, New Liskeard, Ont. 6

SITUATION WANTED

French-Canadian, married, speaking both languages, with fair education, experienced along line of sash and door manufacturing, able to take charge of department. State age, experience and salary desired. Box No. 314, R. Boisvert, Saint Jean, P. Q. 6

Public Roads Bureau Gets $483,320 by New Act

U. S. Congress has finally passed and the President has approved the appropriation bill for the Department of Agriculture for the new fiscal year beginning July 1. For the Bureau of Public Roads the bill makes available $483,320, of which $367,120 is for various investigations and $116,200 for administration.

The appropriations include: $66,800 for investigations of road management and highway construction; $77,060 for investigation of best methods of road making; $175,000 for investigation of chemical and physical character of road material; and $15,000 for maintenance and repairs of experimental highways.

San Francisco Awards Contracts on Hetch Hetchy Power Units

The San Francisco Board of Public Works on April 28 awarded contracts for equipment to be used in the Moccasin Creek power plant on the Hetch Hetchy water-supply project. It is the present intention to sell power from this plant to one of the large power companies. Deliveries on the units for which contracts have just been awarded are limited by agreement to the period between April 15, 1923, and Aug. 31, 1923.

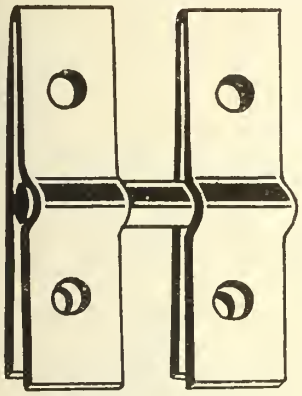
Contracts awarded were as follows: Pelton Water Wheel Co., four 25,000-h.p. double-overhung impulse units, $248,000; General Electric Co., four 20,000 kv.a. generators with exciters and one space exciter set $260,285; and the Coffin Valve Co., eight 36-in. valves, $37,586. The electrical units involve a departure from standard practice in that they have direct-connected over-hung exciters.

Building Operations Increase 32 Per Cent

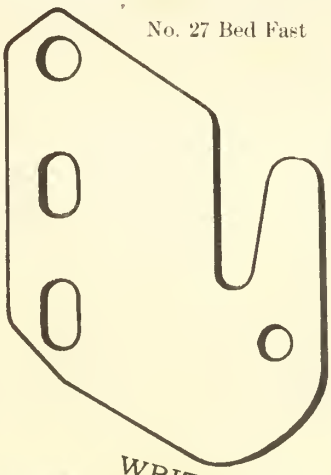
Building operations in the United States increased 32 per cent. in 1921 over the previous year, according to a report of the department of labor. Wholesale cost of building materials, the report said decreased 38 per cent. in the same period and the average total cost of one family dwelling was $4,314 in 1920, compared with $3,925 in 1921.

Construction of one family dwellings increased 71 per cent. in 1921, two family dwellings 211 per cent. and multi-family houses (apartments and tenements) 201 per cent. Permits issued in 1921 were estimated to provide for 125 per cent. more families than those issued in1920.

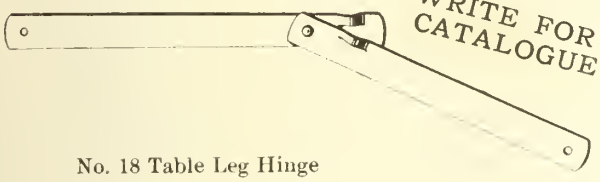
The statistics were based on reports from 140 cities.



No. 15 Friction Hinge



No. 27 Bed Fast



No. 18 Table Leg Hinge

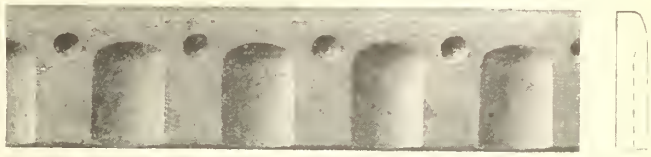
WRITE FOR CATALOGUE

Furniture Trimmings and Special Hardware

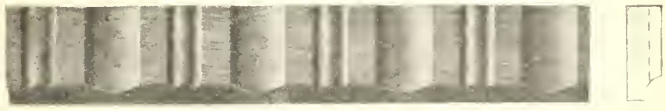
We Also solicit your enquiry for Special Stampings

Larsen & Shaw, Limited
Walkerton, Ontario

CARVED MOULDINGS, CARVINGS, CARVED LEGS



No. D 775 (Reduced One-Half)



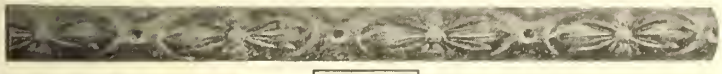
No. D-763 (Reduced One-Half)

"KLISE' mouldings are carved, not pressed. Made in several hundred classic, period designs, in various sizes and shapes.
Catalogue of legs and samples of mouldings sent on request. Send us your designs or samples of carvings for quotation.

KLISE MANUFACTURING COMPANY
Grand Rapids, Michigan

M 97

M 88



M 77

M 91

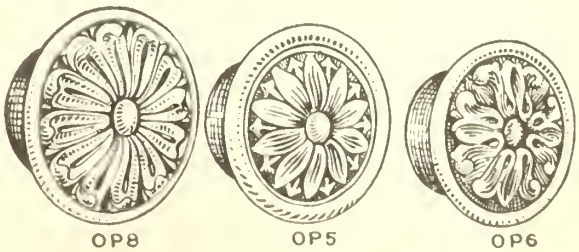
M 72

M 73

MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.



OP8 OP5 OP6

Waddell Manufacturing Company

Coldbrook and Taylor, N. W. **Grand Rapids, Mich.**

Lowest Rate per Interested Reader

OUR Advertising Rates are the lowest in Canada per interested reader. We cannot interest everybody in our business papers, but we can guarantee that all our subscribers read our papers thoroughly and represent the highest possible percentage of buyers in that specific trade.

An advertisement is only as good as the interest that quality subscribers have in the publication in which it appears.

When making your appropriation look into the facts of circulation, both quantity and quality, the reader interest and the service that goes with an established Hugh C. MacLean Publication.

Hugh C. MacLean Publications

Contract Record and Engineering Review, Canada Lumberman, Canadian Woodworker, Electrical News, Footwear, Commercial, Western Contractor and Builder, Western Lumberman, Western Canada Coal Review.

Vancouver Winnipeg TORONTO Montreal Chicago

Printing Plants in Toronto, Winnipeg and Vancouver

—Motors—

RELIABILITY - KNOWLEDGE - PRICE

Motors—60 Cycle

1—3 H.P. Packard, 3 phase, 220 or 550 volts.
6—1/6 H.P., single phase new.
1—5 H.P. Can. Gen. Electric.
1—7½ H.P. Lincoln, and one 7½ H.P. Fairbanks.
1—10 H.P. Gen. Elec. and Lincoln.
1—20 H.P. General Electric.
1—30 H.P. newly rewound by Swedish General Electric.
4—25 H.P. General Electric.
1—50 H.P. General Electric.
1—75 H.P. General Electric.
1—100 H.P. Westinghouse and General Electric.
Above 5 H.P. motors equipped with regular starters.

Motors—25 Cycle

1—5 H.P. Crocker-Wheeler, 1500 r.p.m., 220 volts.
1—2 H.P. Langdon Davies, 1500 r.p.m., 500 volts.
r.p.m.
1—40 H.P. Westinghouse, 720
1—15 H.P. British Gen. Elec.
Other various sizes and new Westinghouse stock all sizes.

Direct Current Motors and Generators
125-250 Volts

1 K.W.
2 K.W. } Westinghouse
3 K.W. } Can. General Elec.
5 K.W. } Lincoln.
10 K.W.
Complete with rheostats and pulleys.

60 Cycle, 3 Phase Generators

60 Cycle, 3 Phase Generators
30 K.W.
50 K.W. 1200 r.p.m. General Elec. and Westinghouse.
75 K.W. Westinghouse.
100 K.W. General Elec., 2300 volts, 900 r.p.m.
300 K.W. Westinghouse, 200 r.p.m.
600 K.W. Electrical Machinery 225 r.p.m.
All, complete with exciters and rheostats.

2—175 H.P., 3 cylinder gas, gasoline or crude oil Westinghouse Vertical Engines —250 r.p.m.

Industrial Engineering Company of Canada Ltd.

CONSULTING ENGINEERS - ELECTRICAL EQUIPMENT
R. G. LEE, General Manager
Carlaw Building, Toronto - Royal Bank Building Windsor, Ont.

"The Phillips Line"

Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

Atlas Mfg. Co. of Orlando

Orlando, Fla., U. S. A.

CLAMP NAILS DO IT

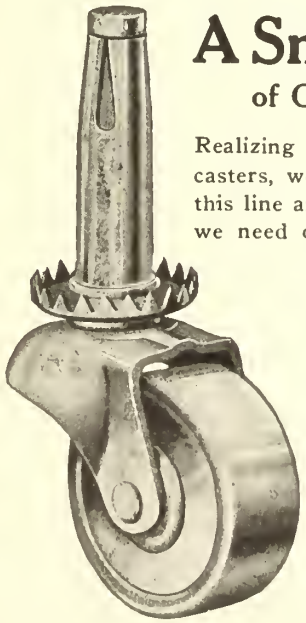
The Cabinet Maker

Internationally known and universally adopted by the leading cabinet makers as the most practical and economical method of mitred joinery.

Samples and circulars on request.

CLAMP NAIL COMPANY

4532 Palmer St. CHICAGO, U.S. A



No. 5

A Small Article

of Great Importance

Realizing the importance of efficient casters, we have made a specialty of this line and as proof of their quality we need only say that many of the foremost furniture manufacturers are using them exclusively.

By the way don't it seem logical that a Canadian-made caster should be the right one to use on Canadian-made furniture? Assuming of course, that it equals the standard of the imported article?

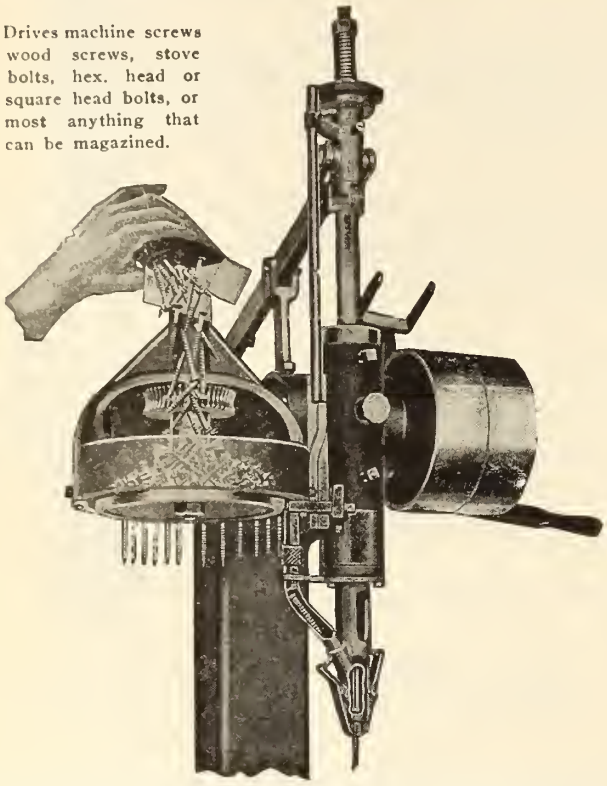
If you believe so too, just write us for samples and prices.

National Hardware Co., Limited

Orillia, Ontario

The Demand is for Lower Prices!

Drives machine screws wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.



Reynolds Automatic Screw Driving Machinery will help you meet the demand

Everywhere the manufacturer is faced with the problem of price reduction. How can he find the solution?

By cutting out every waste—of time, labor materials, etc.

Many manufacturers have installed Reynolds Screw Driving Machinery for this reason. It accomplishes the work better in one-third of the time.

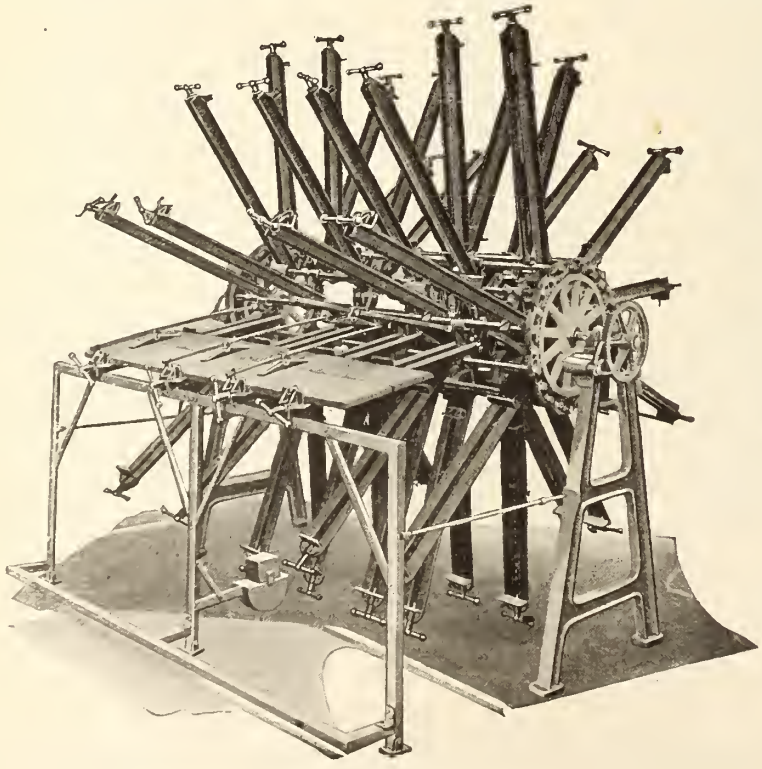
Consequently they are able to meet the demand for lower prices and hasten the return to normal buying.

Are you interested? Then write us to-day for the full facts.

Send us dimensions over all of your work and gauge and length of screws driven so that we can determine the proper size and type machine to meet your requirements.

The Reynolds Machine Co.
Department C.
Massillon, Ohio, U.S.A.

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK

CLAMP CARRIER
for
Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.

HYDRAULIC VENEER PRESSES
AND
LUMBER ELEVATORS

Write for Explanation of our Most Efficient Veneer Package Handling System

E. B. VAN ATTA & CO., INC.
OLEAN, N. Y.

New York City Office: 50 Church St. **Chicago Representative: Fader Machinery Company, 549 Washington Boulevard**

BOOKS FOR SALE

The following books are offered at special prices subject to previous sale:

"Machine Molder Practice," recently published by the Practical Books Co. 172 pages, 100 illustrations. Flexible leather binding. Price $3.00.

"The Utilisation of Wood-Waste," by Ernest Hubbard. Third English revised and enlarged edition, 236 pages, illustrated. Published in 1920 by Scott, Greenwood & Son. Price $2.00.

"Modern Practical Joinery,"—A comprehensive treatise on the practice of joiner's work by hand and machine. For the use of Workmen, Builders, Machinists and Architects. Containing a full description of drawing instruments and their use; tools, appliances and apparatus; methods and processes; joints and fastenings; woodworking machines; machine shop practice; preparation of work for machining; use of the steel square; house joinery, bank, office, church, museum, domestic and shop fittings, show cases, air-tight cases, splayed and shaped work; new materials and method, stairbuilding, foremen's work, fixing, and a description of nearly 150 woods suitable for joinery. Together with a comprehensive glossary and index. By George Ellis—fourth edition, extensively revised and much enlarged. With upwards of 1400 illustrations, including 20 double page and 41 photographic plates. Recently published by B. T. Batsford Limited, 570 pages. Price $12.50.

"The Kiln Drying of Lumber," a Practical and Theoretical Treatise, by Harry Donald Tiemann, M.E., M.F. Just published, by J. B. Lippincott Co. 316 pages, illustrated. Price $5.00.

Seasoning of Wood; A Treatise of the Natural and Artificial Processes Employed in the Preparation of Lumber for Manufacture, with Detailed Explanations of its Uses, Characteristics and Properties, by Joseph Wagner. Published by D. Van Nostrand Co., in 1917. 274 pages, illustrated. Price $3.00.

"Modern Practical Carpentry"—For the use of Workmen, Builders, Architects and Engineers. Containing a full description of the methods of constructing and erecting roofs, floors partitions, scaffolding, shoring, centering stands and stages, coffer dams, foundations, bridges, gates, tunnels excavations, woods and half timber houses and various structural details. Together with new and simple methods of finding the bevels in roofs, setting out domes, steeples, etc. An account of failures in construction, and the theory of trussing frames. Also including a concise treatise upon timber; notes on the woods used in carpentry; various tables; a glossary of terms and phrases connected with carpentry; and a chapter on the uses of the steel square. With about 1100 illustrations. By George Ellis—second edition revised. Recently published by B. T. Batsford Limited, 396 pages,—price $7.50.

Woodworker Publishing Co., Limited
345 Adelaide Street West, Toronto, Ont.

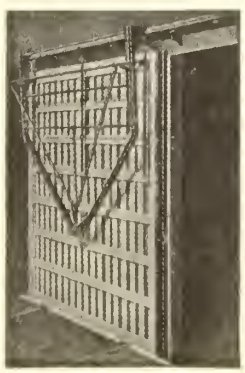
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Nellson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

896

KILNS REMODELED TO THE GRAND RAPIDS VAPOR PROCESS

Among these are:—

Hayward Lumber Co., - Edmonton, Alberta.
J. & D. A. Harquail, Ltd., - Campbellton, N.B.
Eastern Car Co., - - - New Glasgow, N.S.
Otto Higel Co., - - - - - - Toronto, Ont.
Gourlay, Winter & Leeming, - Toronto, Ont.
Houston Co. Ltd., - - - - - - Tweed, Ont.
Williams Piano Co., - - - - Oshawa, Ont.
Reitzel Brothers, - - - - Waterloo, Ont.

Are your kilns giving satisfaction? Let us go into this problem with you. No obligation incurred.

GRAND RAPIDS VAPOR KILN
Grand Rapids, Michigan
Western Vapor Kiln Co , Seattle, Washington

NAILS AND WIRE

For Every Need in the Woodworking Industry

Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

Laidlaw Bale-Tie Co., Ltd.

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

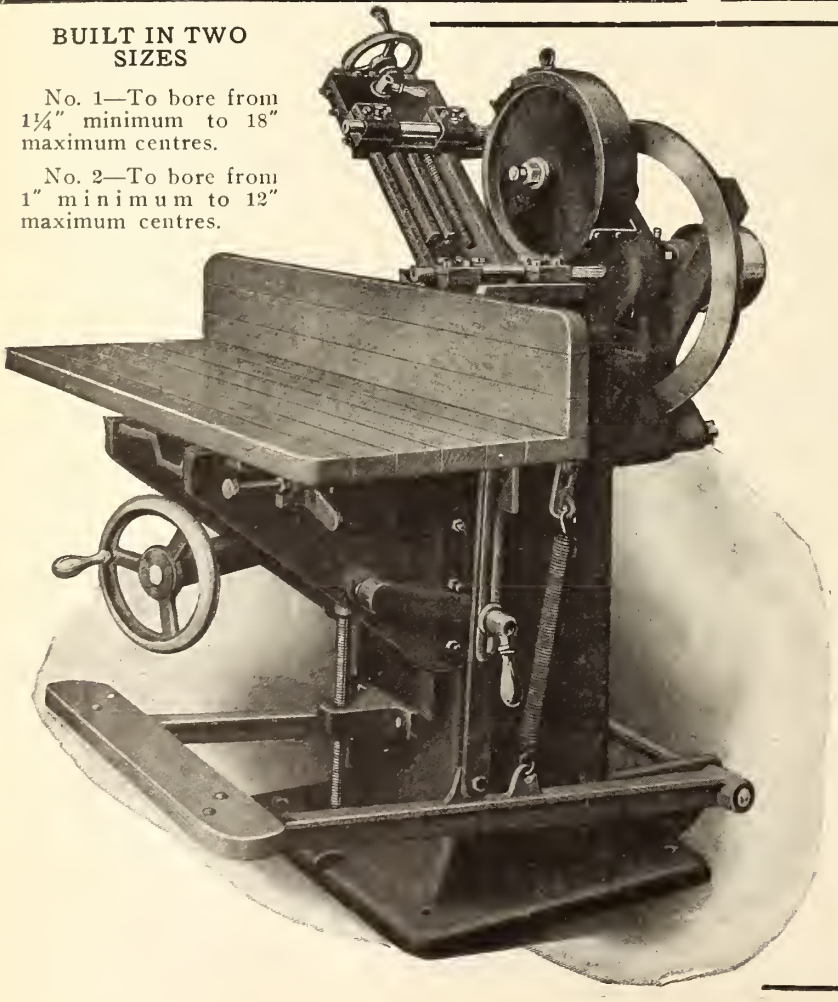
Quite Often

you will find the very thing you are looking for in these advertising pages .It will pay you to read them.

BUILT IN TWO SIZES

No. 1—To bore from 1¼" minimum to 18" maximum centres.

No. 2—To bore from 1" minimum to 12" maximum centres.



DOUBLE SPINDLE RADIAL BORING MACHINES

This machine is the standard of the furniture manufacturing world. It is finished with accuracy and combines versatility with never failing reliability.

The table is actuated with a central connecting rod, preventing the bureau drawer effect. The large intermediate gear is supported at any position by the large segment on the rear of the column. This rigid support eliminates the vibration set up by the action of the teeth and materially prolongs the life of the spindles.

A new Close Center Attachment has recently been perfected. It is universal and will bore two 5 16" holes anywhere in a circle of 1¼" with minimum centers of ½".

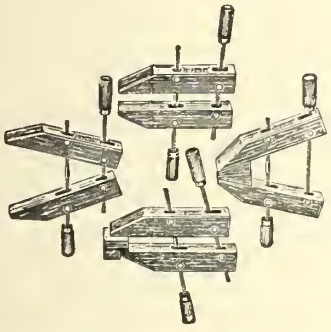
The new Quick Action Clamp attaches to the fence and eliminates the old stick.

Remember we can bore all of your holes at one time if you so desire

VALLEY CITY MACHINE WORKS
Campau Ave. and Fulton St.. N. W.
Grand Rapids, Michigan, U. S. A.

"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.



"Jorgensen"

Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

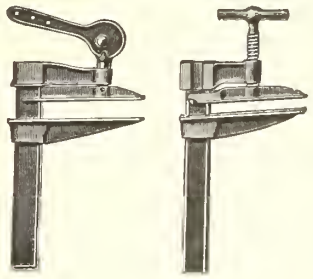
For Sale By

Aikenhead Hardware Limited .....Toronto
Caverhill Learmont Co. .....Montreal
Lewis Bros., Limited .....Montreal

Colt's Clamps

for the

Woodworker



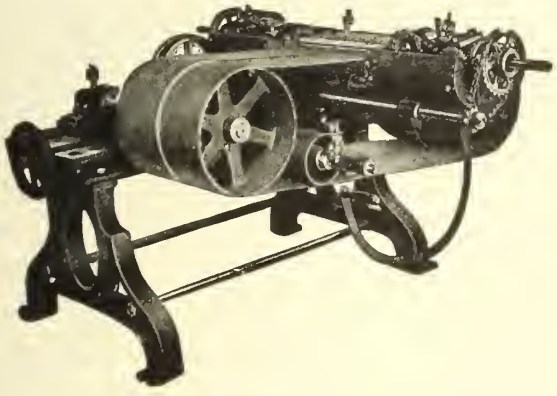
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



Give your Broom Handles a nice Smooth Finish and get Highest Prices for them. The "OBER" Automatic Sander will do the work Rapidly and Economically. We build Laths, Sanders, Rip-Saws, Bolters, chucks, Chucking Machines, etc. for making Handles of various kinds, Ball Bats, Whiffletrees, Neck Yokes, Spokes, Golf Shafts, etc.

Write for free catalogue No. 31.

The Ober Mfg. Co.

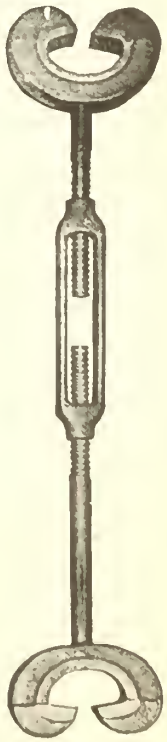
Chagrin Falls, O., U.S.A.

Better work follows the use of the "Empire"

There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

Get in touch with us now. We can make prompt delivery from stock.

We specialize in all types of woodworking tools.



Empire Tool Works

Toronto - Ontario

The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Co., Chicago, Ill.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARINGS
Canadian SKF Company, Toronto, Ont

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P.B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner Mass.
Williams Machinery Co., A. R., Toronto, Ont.

BEVEL & MITRE SAWS
Pettingell Machine Co. Amesbury, Mass.

BIRCH
Edward Clark & Sons, Toronto, Ont.

BLOWERS
Canadian Blower & Forge Co., Kitchener, Ont.

BLOW PIPING
Canadian Blower & Forge Co., Kitchener, Ont.
Neville Cooper Co., Toronto.

BOILERS
Engineering & Machine Works, St. Catharines, Ont.

BORING MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Son Co., L. G., Gardner, Mass.
Nash, J. M., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Reynolds Machine Co., Massillon, Ohio.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont
Valley City Machine, Works, Grand Rapids, Mich.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

BUTTONS
Rowe Mfg. Co., Newaygo, Mich.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

CARVINGS
Klise Mfg. Co., Grand Rapids, Mich.
Decorators Supply Co., Chicago, Ill.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Preston Woodworking Machinery Company, Preston, Ont.

CARVED WOOD MOULDINGS
Klise Mfg. Co., Grand Rapids, Mich.

CASTERS
Foster, Merriam Co., Merriden, Conn
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Shurly-Dietrich, Galt, Ont.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Bell Machine Co. Oshkosh, Wis.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company, Preston, Ont.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

CLAMP CARRIERS
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.

CRATING LUMBER
Lloyd, W. Y., Toronto, Ont.
Colborn, C. B., Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D., Guelph, Ont.

CUT-OFF SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.
Richards-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

DOWEL MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
W. S. Hawker Mfg. Co., Dayton, Ohio.

DOWELS
Canada Wood Specialty Co., Ltd., Orillia, Ont
Rowe Mfg. Co., Newaygo, Mich.

DRIERS(Hot Plate)
Merritt Eng & Sales Co., Lockport, N.Y.

DRIERS (Veneer)
Merritt Eng & Sales Co., Lockport, N.Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont
Cutler Desk Co., Buffalo, N. Y.
Grand Rapids Veneer Works, Grand Rapids Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

DYNAMOS
Industrial Engineering Co., Toronto, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont
Simonds Canada Saw Co. Montreal, P.Q.

EDGER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

ENAMELS
Cosmos Chemical Co., Port Hope, Ont.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont
Garlock Machinery Ltd., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.

FEED ROLLS
Atkins & Co., E. C., Hamilton, Ont.

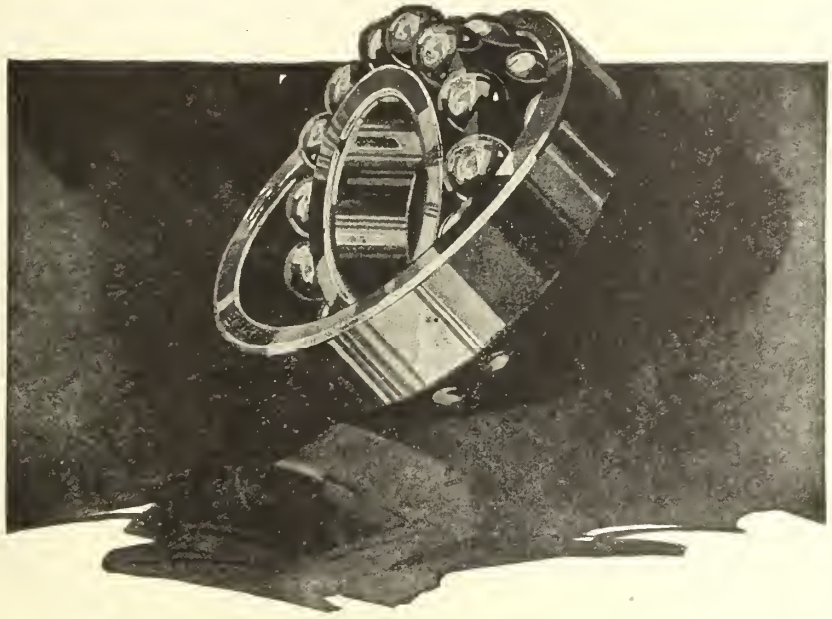
FINISHING PRODUCTS
Campbell Co., M. L., Kansas City, Mo.

FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FIBRE PRODUCTS
Carter, E. T., Toronto, Ont.
National Patent Reed Sales Co., Philadelphia, Pa.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SKF



Wherever Misalignment is a Factor

THE operation of your machine will not be successful unless its bearings function in complete harmony with other parts. Deflections in the shaft, weaving in the frame and other causes may create severe stresses in all parts of the bearing, unless the latter has some inherent means to compensate for this misalignment.

The **SKF** marked self-aligning bearing operates on the same principle as the ball and socket joint and is therefore capable of taking care of the severest misalignment, Moreover the aligning action is positive, immediate and automatic.

The self-aligning bearing is a product of the Canadian **SKF** Co., Limited, and is sponsored by the **SKF** Industries. Its manufacture embodies all the minute care, precision and quality for which the mark **SKF** stands. The world-wide experience of this organization is put at your disposal, free of any obligation on your part.

CANADIAN **SKF** COMPANY, LIMITED

Toronto and Montreal

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.
Dominion Appraisal Co., Toronto, Ont.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GEARS
Hamilton Gear & Machine Co., Toronto, Ont.

GLUE
Caumon Canadian Co., Toronto, Ont.
Coignet Chemical Products Co., New York N.Y.
Kane Manufacturing Co., Chicago, Ill.
Monite Waterproof Glue Co., Minneapolis, Minn.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Rush Lumber Co., Memphis, Tenn.
Thomas & Proetz Lumber Co., St. Louis Mo.
Turner-Farber-Love Lumber Co., Leland, Miss.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.

HARDWOOD DIMENSION STOCKS
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson-Tully Co., Memphis, Tenn.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree Ark.
Clark, Edward & Sons Toronto
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Dudley Lumber Co. Inc., Memphis, Tenn.
Farrin Lumber Co. M. B., Cincinnati, Ohio.
Frye Lumber & Veneer Co., J. W., Dayton, O.
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La
Hafner Manufacturing Co., St. Louis, Mo.
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co. Toronto, Ont.
Kinnon Lumber Co., Ltd., Toronto, Ont.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Otis Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont
Pickrel Walnut Co., St. Louis, Mo
Richards Hardwood Co., Memphis, Tenn.
Rush Lumber Co., Memphis, Tenn.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn
Stimson & Co., J. V., Owensboro, Ky.
Sullivan, Frank T. Buffalo, N.Y.
Thomas & Proetz Lumber Co., St. Louis Mo.
Turner-Faber-Love Lumber Co., Leland, Miss.
Vail Cooperage Co., Fort Wayne, Ind.
Whiting Co., Wm. S., Johnson City, Tenn.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng & Sales Co., Lockport, N.Y.
Van Atta & Co., E. B., Olean, N. Y.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LACQUERS
Cosmos Chemical Co., Port Hope, Ont.
Celluloid Zapon Co., New York, N. Y.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

LEGS
Klise Manufacturing Co., Grand Rapids, Mich.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Preston Woodworking Machinery Company,
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.

MOTORS
Industrial Engineering Co., Toronto, Ont.

MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont

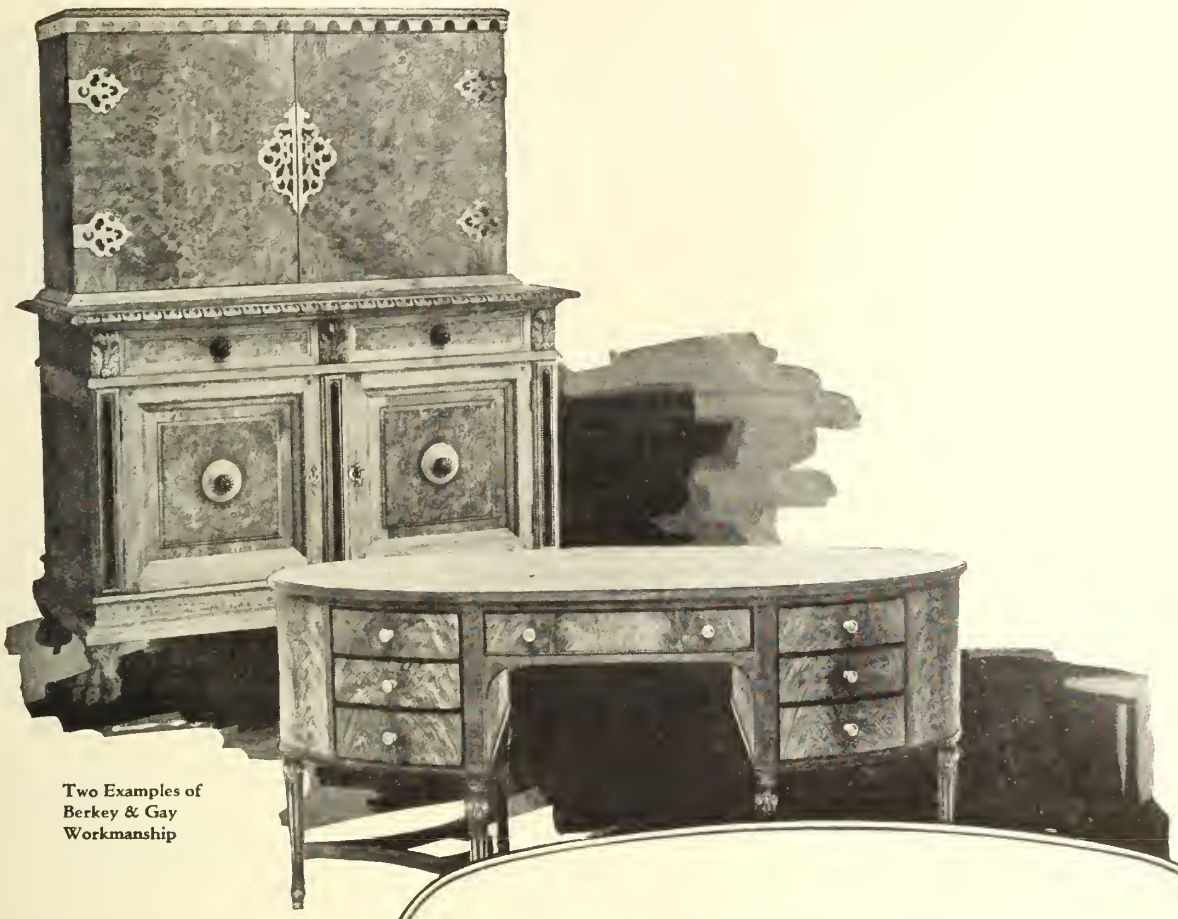
NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.
Yates Machine Co., P.B. Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PAINT
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Calhoun Plywood Co., Sheboygan, Wis.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.



Two Examples of Berkey & Gay Workmanship

Master Finishers at the Berkey & Gay Plant Use Carborundum Brand Garnet Paper and Cloth

THE name Berkey & Gay is always associated with the distinctively beautiful because in design, quality and workmanship Berkey & Gay furniture is the product of the artistry of master craftsmen.

In the creation of such furniture finish is an all-important factor. That is why many of the skilled sanders in this plant use Carborundum Brand Garnet Paper and Cloth—clean cutting, uniformly coated, flexible products that can be depended on to uphold the standards of good workmanship.

Carborundum Brand Garnet Products make good sanders better sanders.

The Carborundum Company

Niagara Falls, N. Y. U.S.A.

New York, Boston, Chicago, Cleveland, Detroit, Cincinnati, Philadelphia, Pittsburgh, Milwaukee, Grand Rapids

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Calhoun Plywood Co., Sheboygan, Wis.
Guelph Patent Cask Co. Scotstown, P.Q.
Wisconsin Veneer Co., Rhinelander, Wis.

PERIOD MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Klotz Machine Co., Sandusky, Ohio.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich
Preston Woodworking Machinery Company Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont

ROSETTES
Klise Mfg. Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co., Herman, Brooklyn, N.Y.

SASH, DOOR & BLIND MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SATINWOOD
Willey Co. C. L. Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P.B. Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont
Simonds Canada Saw Co. Montreal, P.Q.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D. Guelph, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW TENONERS
Pettingell Machine Co. Amesbury, Mass.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

SHELLAC
Kasebier-Chatfield Shellac Co.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A.. Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW FILING MACHINERY
American Saw Filing Machine Co. Boston, Mass.

SAW TENONERS
Pettingell Machine Co. Amesburp, Mass.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Bruce Woodworkers Ltd. Chesley, Ont.
Walter & Company, B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

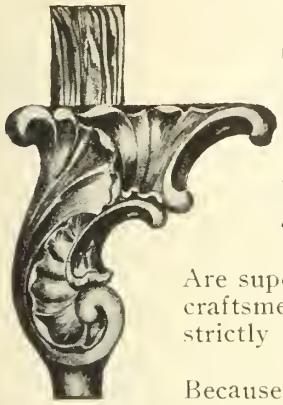
TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Klise Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.
Walter & Sons, J. Kitchener, Ont.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

TWIST WORK
Klise Mfg Co., Grand Rapids, Mich.

UPHOLSTERY
Oriental Textiles Co., Oshawa, Ont.



OVERTON

FINE

Leg Carvings

Are superbly designed by leading craftsmen. The workmanship is strictly high grade.

Because we have a staff of skilled workers and the most improved machinery we are able to turn out excellent workmanship in large quantities on short notice.

Our designing department is at your service We will reproduce your own designs with perfect fidelity.

Write for full information.

S.E.OVERTON CO.
"Our Quality Is Always Higher Than Our Price"
ARTISTIC WOOD CARVINGS

South Haven, Michigan, U.S.A

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY
17 State Street NEW YORK CITY

NEW AND USED
Woodworking Machinery

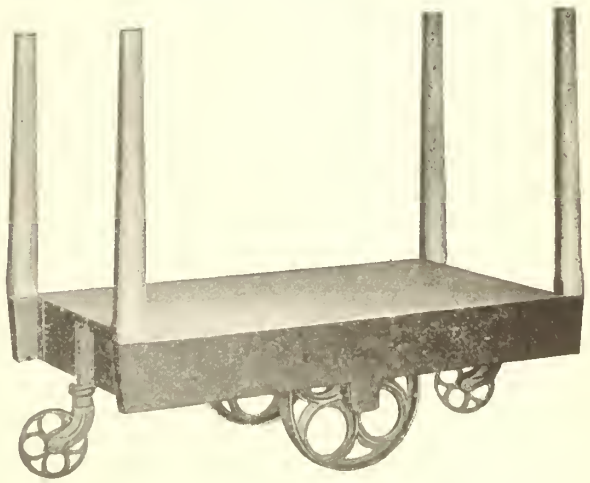
C.M.C. double carriage cut-off saw.
60″ Fay & Egan re-saw.
60″ Egan band re-saw.
54″ McDonough horizontal band re-saw.
42″ West Side band re-saw.
12″ C.M.C. four-side moulder.
American variety woodworker.
No. 551 C.M.C. chain saw mortiser.
18″ Defiance handle lathe.
30″ Boss double surface planer and matcher.
24″ Clark-Demill planer and matcher.
24″ Yates, single surface planer.
24″ Cowan pony planer.
20″ Preston pony planer.
48″ Berlin, three-drum sander.
42″ Invincible three-drum sander.
20″ American wood scraper.
Preston double head tenoner.
Gerlach stave machine.
Long lath bolter.

Write for full particulars and our complete stock list

H. W. Petrie, Limited

131—147 Front Street West
Toronto

NOW IS THE TIME



To Cut Your Production Cost by Using

"GLOBE"

ALL STEEL FACTORY TRUCKS

Made in 3 sizes:
24 x 52 28 x 58 34 x 70

Globe Vise & Truck Co.

GRAND RAPIDS, MICH.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Ault & Wiborg Company, Toronto. Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Guelph Patent Cask Co. Scotstown, P.Q.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Wisconsin Veneer Co., Rhinelander, Wis.
Wood Mosaic Co., Louisville, Ky.
Willey Co. C. L. Chicago, Ill.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company. Kitchener, Ont
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Van Atta & Co., E. B., Olean, N. Y.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids. Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Des Moines Sawmill Co., Des Moines, I.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.
Sullivan, Frank T. Buffalo, N.Y.

WASTE
Carter, E. T., Toronto, Ont.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

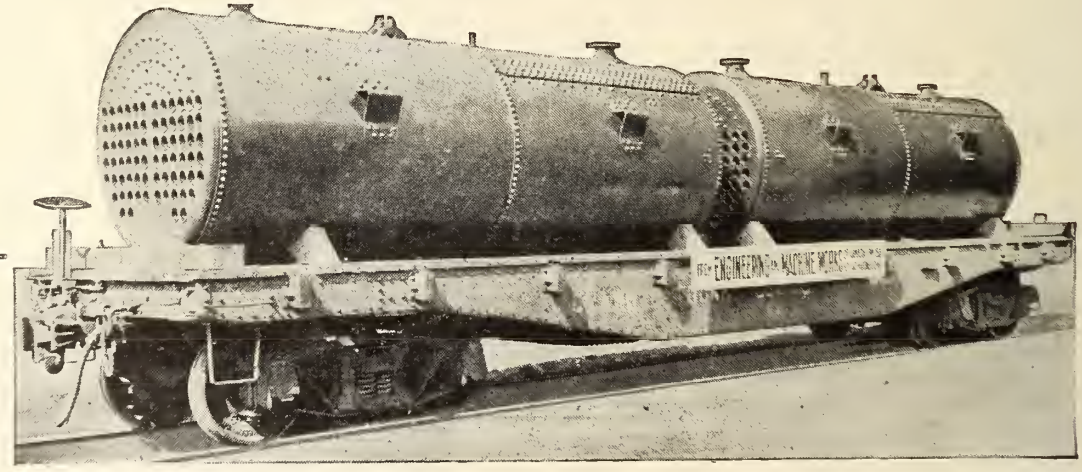
WOOD FINISHES
Ault & Wiborg, Toronto, Ont.

WOODWORKING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Elliot Machinery Co. Belleville, Ont.
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids. Mich.
Pettingell Machine Co. Amesbury, Mass.

WOOD TURNING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Elliott Machinery Co., Belleville, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P.B. Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids. Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids. Mich.

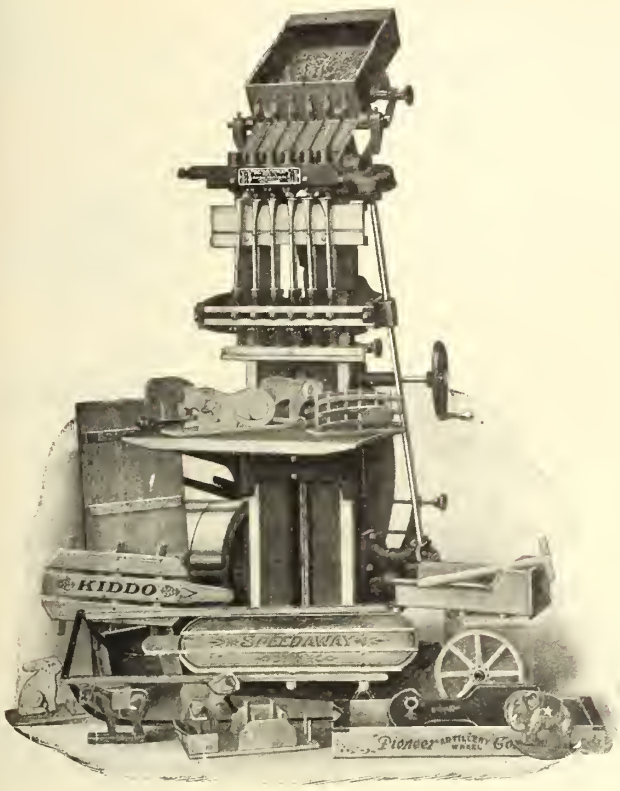


A good new Boiler is a real Dividend Maker

Especially when you can get the high quality of workmanship and the extra tested materials we employ (We have been at this business 36 years). As for prices—they are very inviting—in fact it doesn't pay any man who needs a Boiler to go without one from us at this time.

Engineering and Machine Works of Canada, Limited
St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal



Morgan No. 6 Nailing Machine

MORGAN
NAILING MACHINES
Used in Nailing Wooden Toys

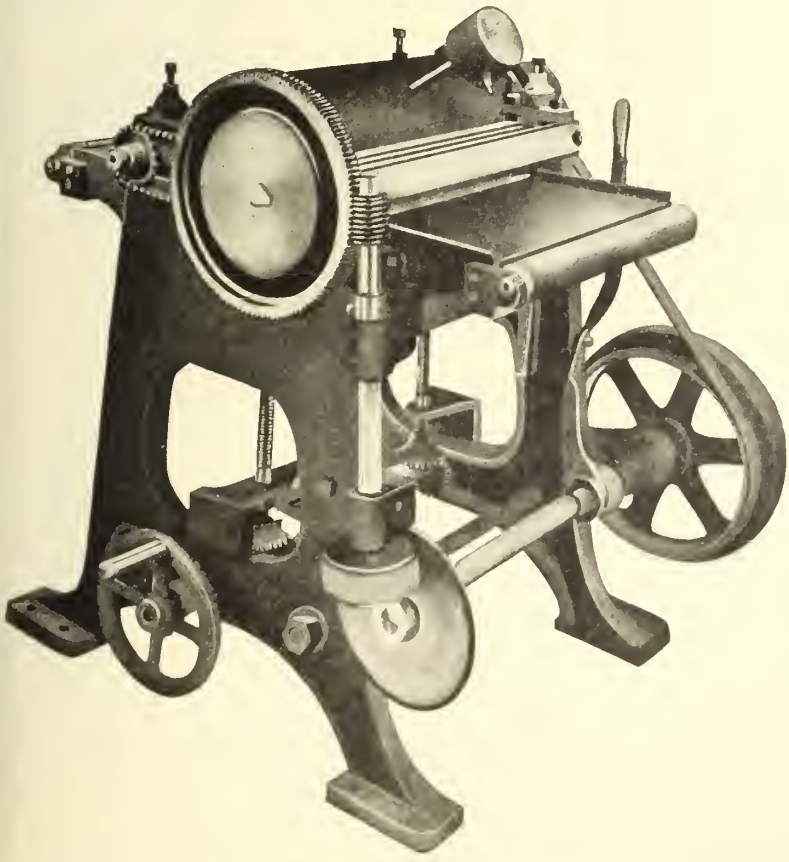
Many manufacturers of American Wooden Toys use our machines for driving 5/8" to 1 1/8" nails. Machines are adjustable in operation and can be adapted to any kind of nailing work.

If you are driving nails by hand, in making boxes, crates, toys, any woodenware articles, figure the cost. It is expensive.

Then send us samples of your work. Get an estimate of the cost of nailing on a Morgan Nailing Machine. Compare the figures. We'll leave the rest to your judgment.

Send us your nailing problems. We shall be pleased to give them our careful consideration and advise you regarding equipment for handling them. We invite your inquiry.

Morgan Machine Company
Rochester, N. Y.



The Elliot Bull Dog Planer

6" x 16"

The facts that the head is run by a worm gear; no pinions on the head and that the feed rolls are driven independent of the head excludes vibration. Hence—it planes smoother than any other Pony Planer made. Also it uses less power.

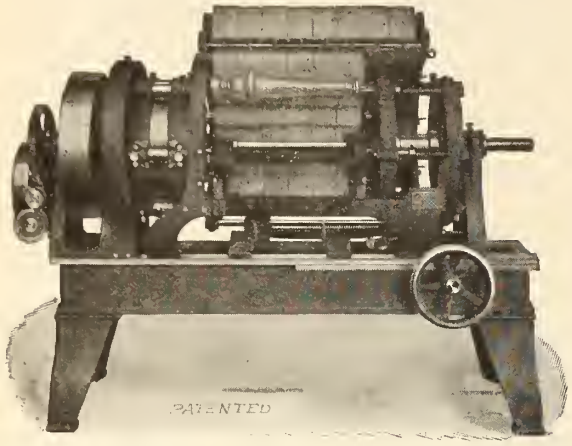
Write for Prices and Catalogue

Elliot Machinery Co.
Limited

Belleville, - - - Ontario

CANADA

ARE YOU SATISFIED



With the quality, quantity and cost of sanding your furniture turnings? If you have a Nash Sander, your satisfaction is justified, not otherwise.

Let me show you the "better way."

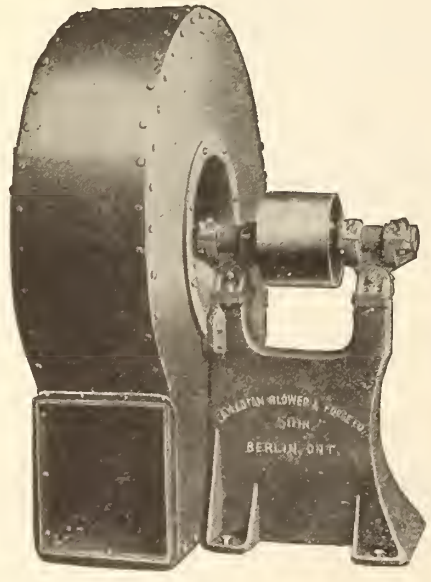
J. M. NASH, Milwaukee, Wis.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.



Canadian Planing Mill Exhauster

Keep your shop clean, remove your sawdust, shavings, or other loose material.

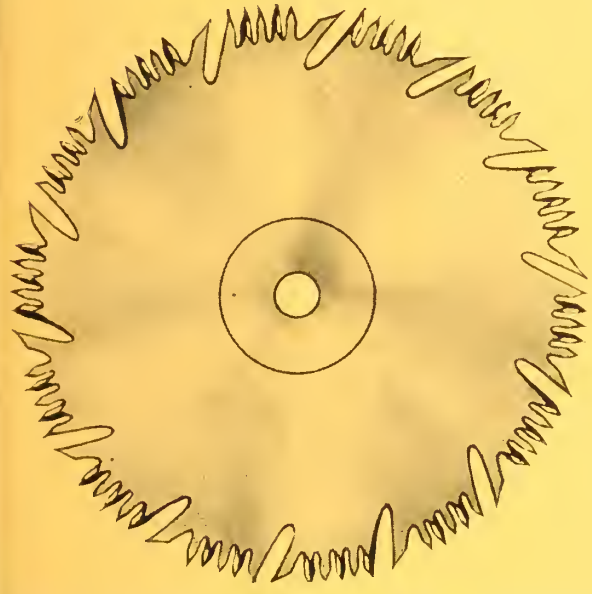
A clean shop with machines free from shavings, chips or sawdust makes for greater efficiency.

Let our engineering department help you plan your refuse exhaust system.

Write for Catalogue 400-13

Canadian Blower & Forge Co.
KITCHENER, ONT.

RADCLIFF SAWS



Sold on a Service Basis

Saw Tools, Machine Knives, Hoe Shanks and Bits, Emery Wheels, Shafting, Belting, Files, Hangers and Filing Room Machinery.

Beaver Brand saws and tools are made to stand up under exceptional tension and cutting tests. Our products must embrace the finest grade crucible steel and the strictest care in tempering if they are to comply with the Radcliff Guarantee. We ask you to prove our claims of superiority. Let us mail one of our catalogs.

Our repair department is at your service. Be sure that name of owner appears on each saw, and mail full instructions of work to be done, stating the hand, speed, and feed of mill together with shipping directions for return of saws.

Agents for
L. & I. J. White Co.,
Machine Knives

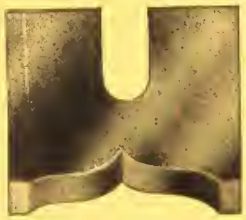
Radcliff Saw Manufacturing Company, Limited

1550 Dundas Street West **TORONTO, ONT.**

ATKINS

STERLING QUALITY

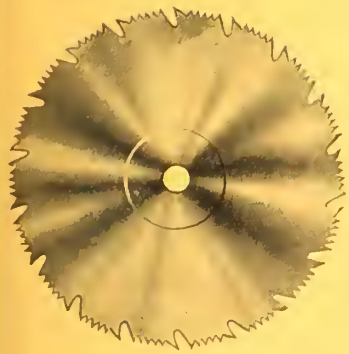
SAWS and KNIVES ECONOMIZE



ARE your saws and knives wasting your lumber? If so, why not turn that waste into a profit by installing

Atkins Sterling Quality Saws

and Machine Knives



Some of the largest woodworking mills in the country are using Atkins Saws exclusively, because they increase production, stop waste and make a name for themselves wherever they go.

Write to-day for our Knife Booklet "C. W." and Pattern Template Paper.

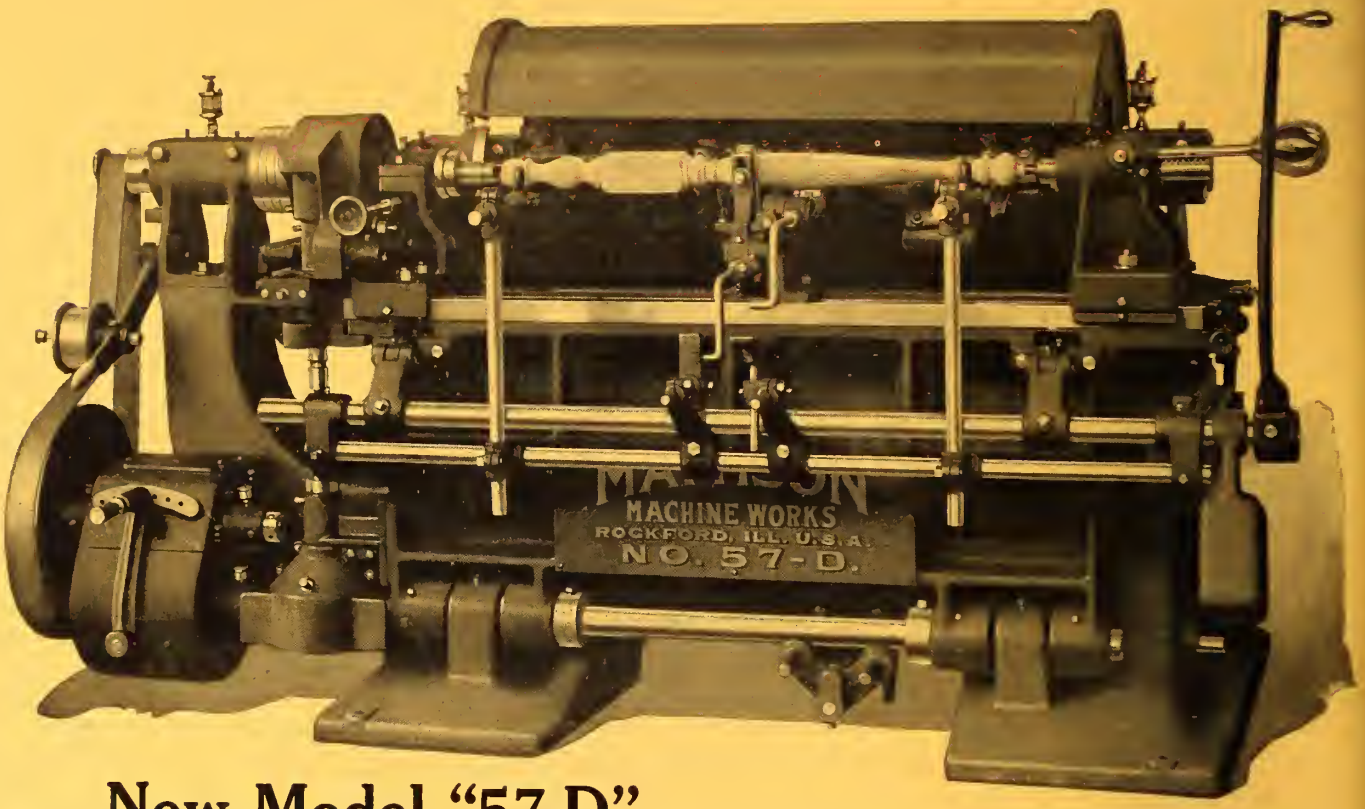
E.C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

The Latest Improved Mattison Lathe

The Standard Machine Turner



New Model "57-D"

IN this New Model D Mattison Automatic Shaping Lathe are found the many improvements and refinements which twenty-five years' experience have shown to be desirable and necessary in a machine of this type.

It is not a radical departure in principle, nor is it a case of taking an old machine and patching on a new piece here, or cutting out something there. Yet it has been completely redesigned from the ground up. It has been made heavier where added weight is essential. Its operation has been made more convenient and faster. Attachments have been simplified to facilitate adjustments and to save time when changing. Gearing has been changed to eliminate readjusting when substituting different work-holding devices, thus insuring the gears against undue wear.

In a word, the developments and refinements on this new Model D Mattison Automatic Shaping Lathe leave nothing to be desired as to efficiency, operating convenience and simplicity. It is the culmination of twenty-five years' experience in continuously developing a principle proven right at the start.

Ask for bulletin describing new features.

Branches:
CHICAGO
1735 Republic Bldg.

GREENSBORO, N. C.
513 American Bk. Bldg.

MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.

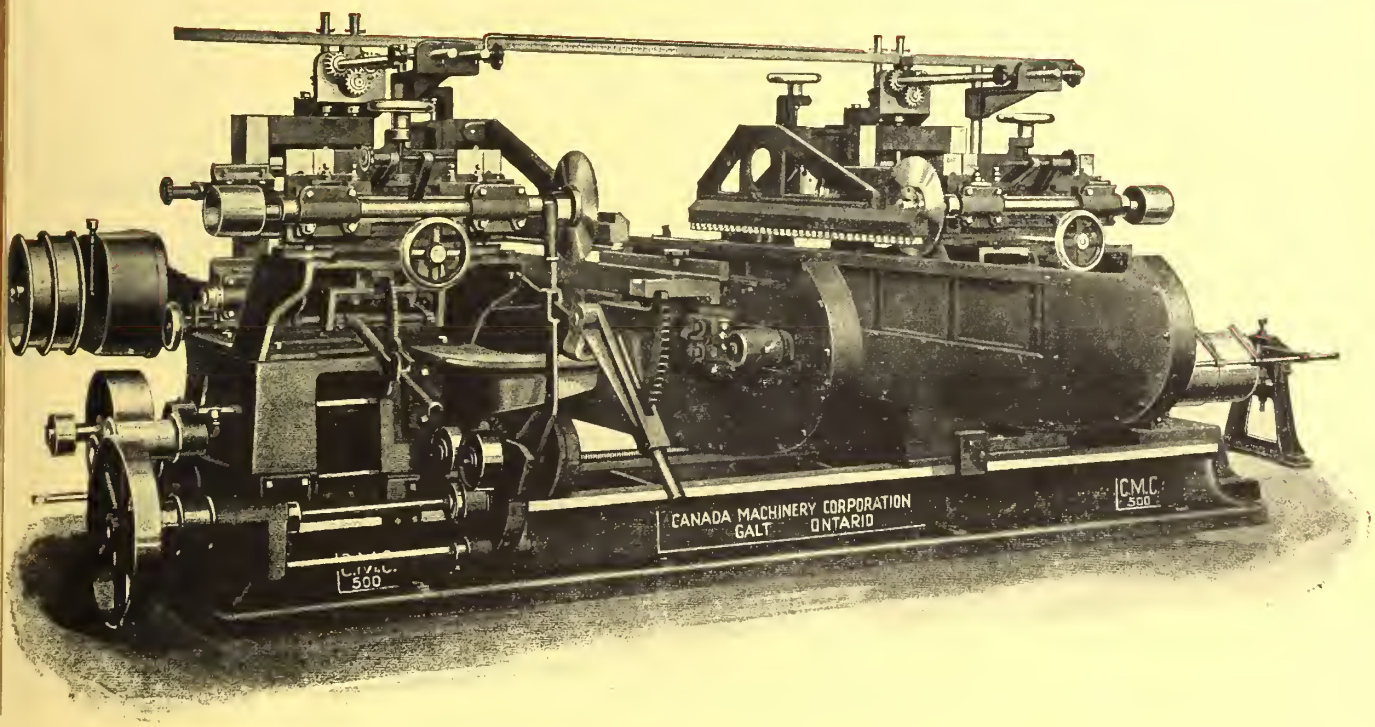
Branches:
NEW YORK
602 Times Building

SAN FRANCISCO
553 Monadnock Bldg.

Sales Representatives for New England: BAXTER D. WHITNEY & SONS, Winchendon, Mass.

ume Twenty-Two TORONTO. July, 1922 Number Seven

CANADIAN WOODWORKER and Furniture Manufacturer



C.M.C. "500" Double End Tenoner

The greatest utility tool on the market. Everything from a Tenoner to a cut-off Saw. Grooving, Gaining, Coping and Tenoning. The heaviest and most accurate machine built. Simple to set up and operate.

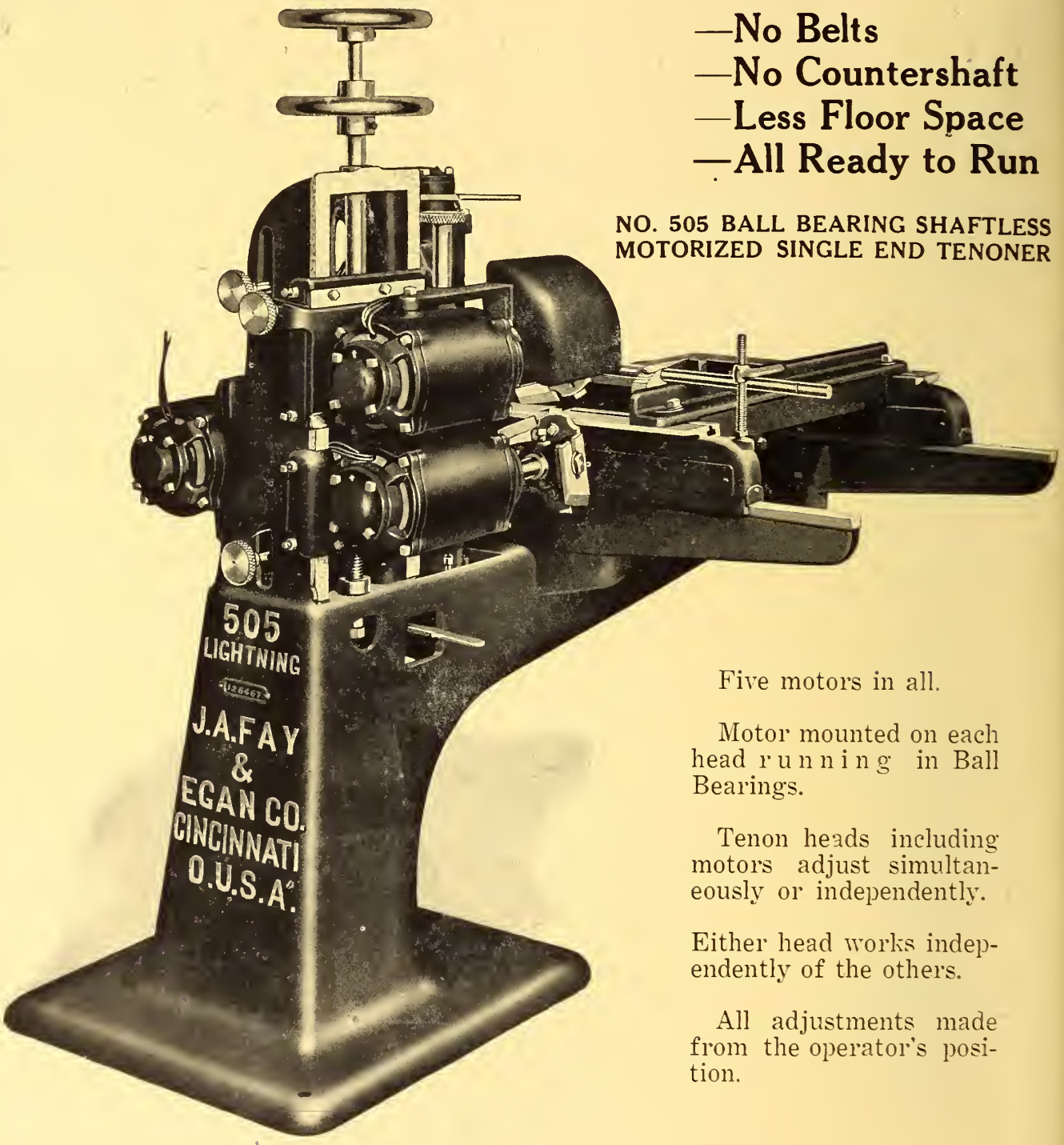
Put a CMC "500" to work and cut machining costs as other manufacturers are doing.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721 Bank of Hamilton Building

Alphabetical Index to Advertisers, Page 12

JUST AS YOU SEE IT—



—No Belts
—No Countershaft
—Less Floor Space
—All Ready to Run

NO. 505 BALL BEARING SHAFTLESS MOTORIZED SINGLE END TENONER

Five motors in all.

Motor mounted on each head running in Ball Bearings.

Tenon heads including motors adjust simultaneously or independently.

Either head works independently of the others.

All adjustments made from the operator's position.

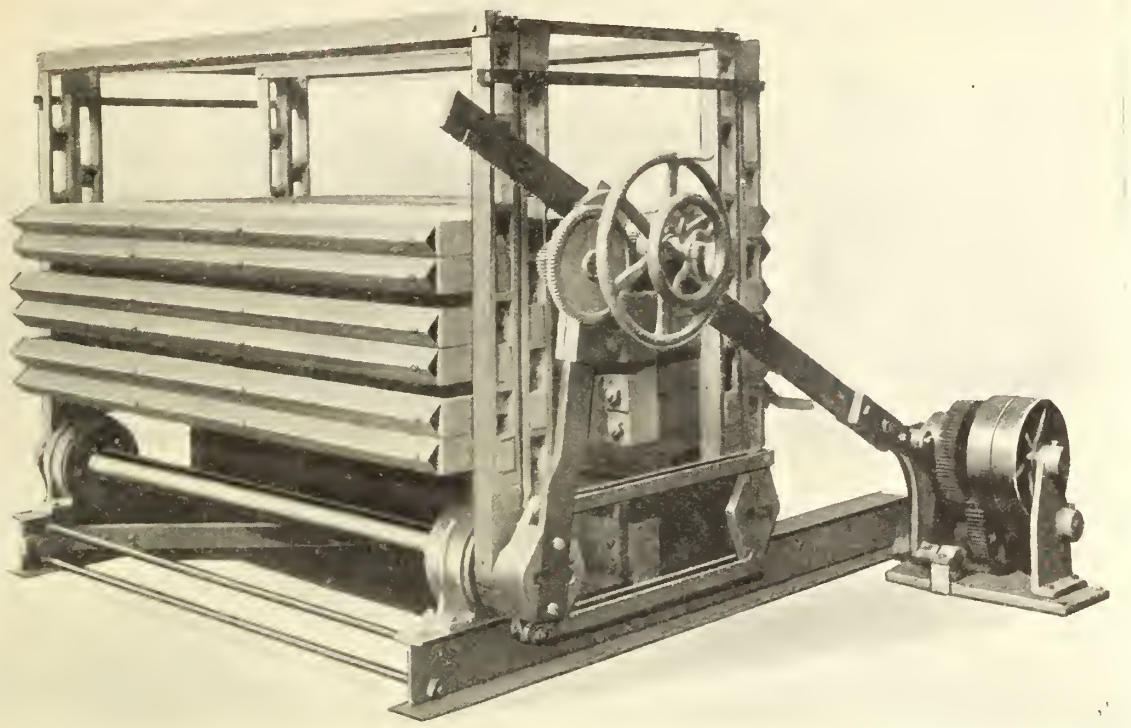
J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St. - - Cincinnati, Ohio, U. S. A.

Exclusive Agents for the Dominion: A. R. Williams Machinery Company, Ltd., Toronto, Ont.
Branches: Montreal, St. John, N. B., Winnipeg, Vancouver



The *Why* of Veneer Troubles

Do you know that—

veneer, unless redried, contains more moisture after it has passed through the glue spreader than ordinary air dried stock.

Veneer with this content of moisture is almost sure to go wrong—sooner or later. Why not make sure that your plywood when glued up, is as dry or dryer than the air—thus insuring yourself against trouble and perhaps loss?

A Perrin Veneer Re-Drier will safeguard you. Its operation is simple. The veneer is inserted between steam heated hot plates which extract the moisture from the wood fibres—from the centre first—and then from the surfaces. The opening and closing of the plates—known as the "breathing movement"—expels the excess moisture from the surface as it is drawn from the centre, allowing the shrinkage to take place naturally and without checking.

The sheets of veneer during this process are flattened out, making the stock easier to handle and simplifying jointing.

Veneer, re-dried by the Perrin Re-Drier will not check and warp or become seamed with hairlines, for it is drier than normal. By this process as much or more moisture is taken out as is added by the glue spreader, consequently your re-dried stock when applied contains approximately 8% moisture.

We can supply a machine with a suitable number and sized plates for your requirements.

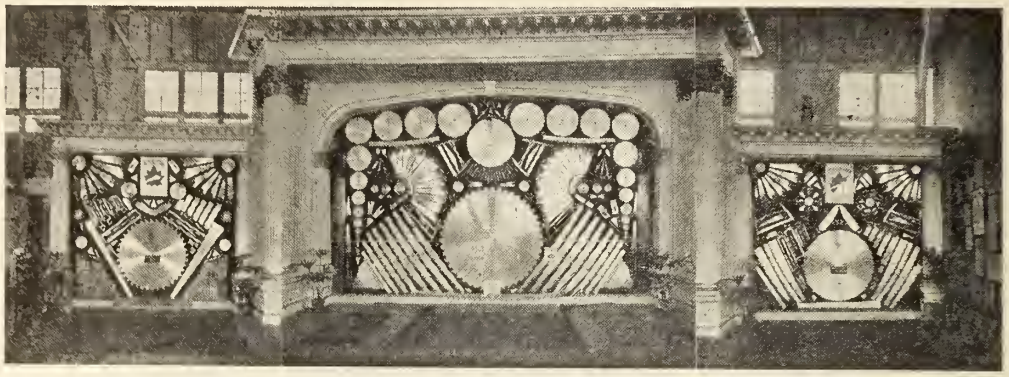
Garlock Machinery Co., Limited

163 Dufferin Street

WINNIPEG - TORONTO - MONTREAL

"Made in Canada by Canadian Workmen"

MAPLE LEAF SAWS



A Saw For Every Purpose

Used by all the principal Woodworking & Furniture Mfgs.

Throughout Canada

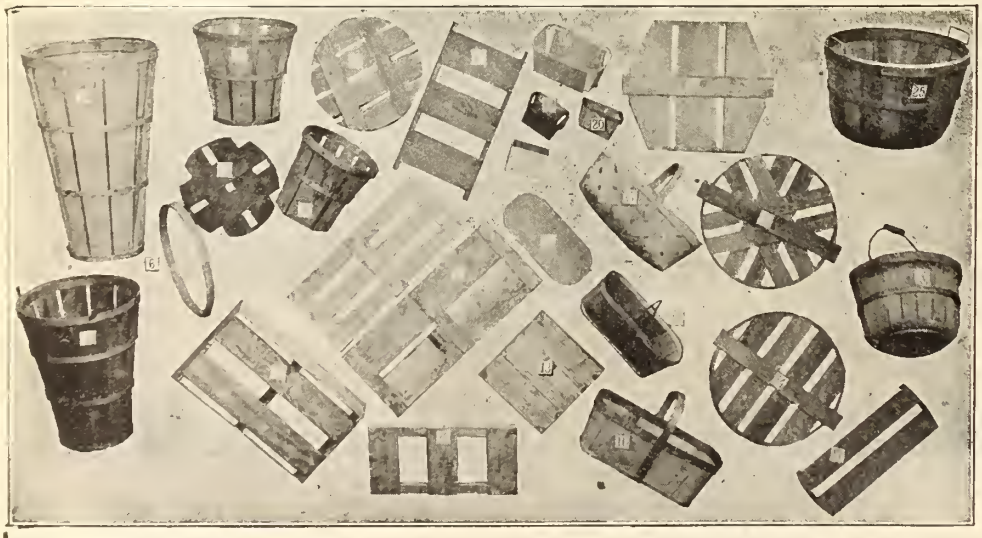
Cross-Cut Saws
Band Saws
Dado Heads

Special Saws
for
Special Work

Circular Saws
Hand Saws
Woodworking Cutters and Knives

Manufactured by
SHURLY-DIETRICH, LIMITED, The Largest all-Canadian Saw Manufacturers
GALT, Ontario

THIS IS THE NAME



of the Machinery for the Rapid Production of

Veneer—Crates—
Baskets—Fruit Packages.

"ST JOE"

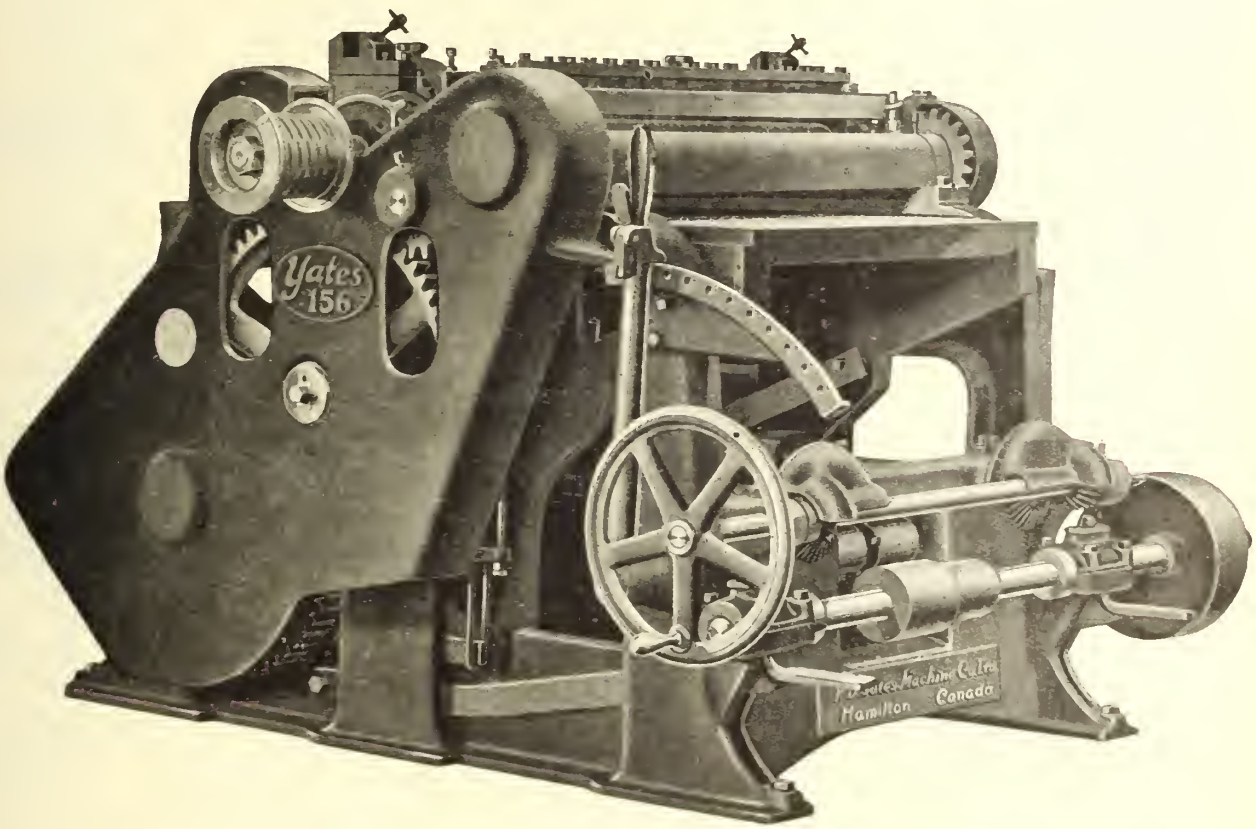
Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

YATES

BALL BEARING

SINGLE SURFACER



The above machine is our New Type Ball Bearing Single Cabinet Surfacer. The Cutter head runs in journals fitted with SKF ball bearings. When machine is equipped with round cutter head, thin knives, sectional roll and chipbreaker, it makes the ideal single surfacer, that will give you the finest quality of finish.

By using the sectional roll, two or more pieces of unequal thickness may be fed into the machine at the same time. The 156 is built in three sizes, 27, 30 and 36 inches wide, takes stock up to 6 inches thick and will efficiently dress stock as thin as $\frac{1}{8}$ inch. Stock can be run thru as short as 6 inches.

Drop us a line for your copy of illustrated circular which explains this machine fully.

P. B. Yates Machine Co. Ltd.

Hamilton, Ontario

The American Universal Floor Surfacing Machine

Does the Work of Five or Six Men

Do your hardwood floor surfacing in one-fifth the time and get better results. Equally good on new or old. Will surface from 4,000 to 7,000 square feet a day once over, depending on conditions, or completely finish up to 3,000 square feet a day at a cost not exceeding $1.00 for power and garnet paper. Write for price and illustrated catalog.

The A. R. Williams Machinery Company Limited

Dept. C—64 Front Street W. TORONTO

Phone Woodworking Dept., Adelaide 20

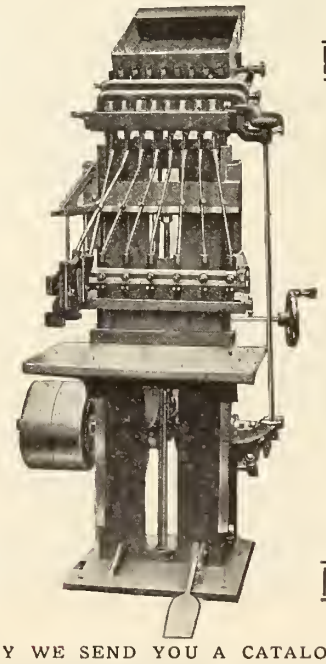
Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractor's Machinery, Electric Motors, Saw, Shingle and Lath Mill Machinery, etc.

Halifax, St. John, Montreal, Winnipeg, Toronto, Vancouver

MADE IN SCOTLAND

ENTIRELY AUTOMATIC

EASILY OPERATED



MACHINES FOR PLAIN

OR ZIGZAG NAILING

BOX NAILING AND

CLEATING MACHINES

ALSO MADE FOR

CLEATING or BATTENING

INSTANTLY ADJUSTED

MADE IN ALL SIZES

MAY WE SEND YOU A CATALOGUE?

MATTHEW WYLIE & Co. Ltd.

81 PORTMAN STREET, GLASGOW

The Shimer Round Safety Cylinder with High Speed Knives

A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

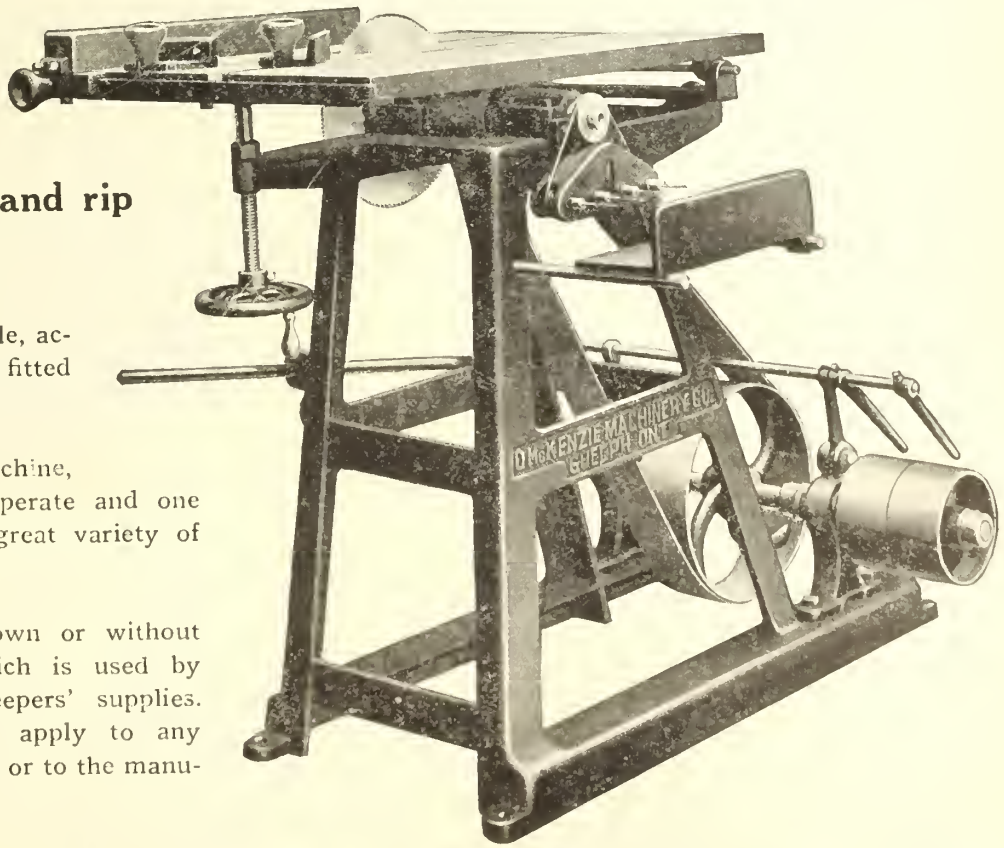
WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

McKenzie



Cross-cut, mitre and rip Saw No. 2

All iron frame and table, accurately machined and fitted insuring good work.

A light inexpensive machine, handy and simple to operate and one which will turn out a great variety of work.

Sold complete as shown or without drilling attachment which is used by manufacturers of beekeepers' supplies. For further particulars apply to any reliable machinery dealer or to the manufacturers.

D. McKenzie Machinery Company, Guelph, Ont.

Cut Gear Specialists

CUT GEARS

Let us handle your gear requirements

Gear Data For Your Note Book

Cut this out,—more coming later

DEFINITIONS AND RULES FOR GEARS
from The HAMILTON GEAR & MACHINE Co., Toronto

Diametral pitch (D.P.) of a gear is the number of teeth per inch of pitch diameter.

Circular pitch (C.P.) of a gear is the distance from centre to centre of teeth measured along the pitch circle.

Circular pitch equals 3.1416 divided by Diametral pitch.

Thickness of tooth at pitch line is half the circular pitch, or equals 1.5708 divided by the D.P.

Addendum is the distance from pitch circle to outside of gear.

Dedendum is the distance from pitch circle to bottom of tooth.

Clearance is dedendum minus addendum, or equals 0.157 divided by the D.P., equals 1-10 thickness of tooth.

If **outside diameter** (O.D.) of a spur gear is given to find diametral pitch, add two (2) to a number of teeth and divide by the O.D. in inches. Reverse process to find O. D.

Pitch diameter equals the number of teeth (T) divided by the Diametral pitch, or it equals the number of teeth multiplied by the circular pitch and then divided by 3.1416.

Distance between centres of two gears is half the sum of their pitch diameters.

Write Us for Quotations

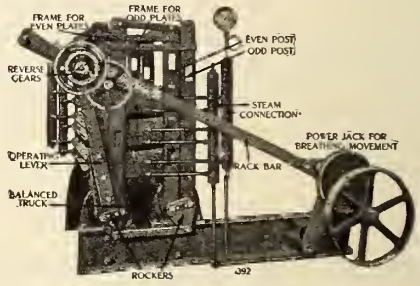
Hamilton Gear & Machine Co.

76 Van Horne St. TORONTO

MERRITT ENGINEERING AND SALES COMPANY LOCKPORT N.Y.

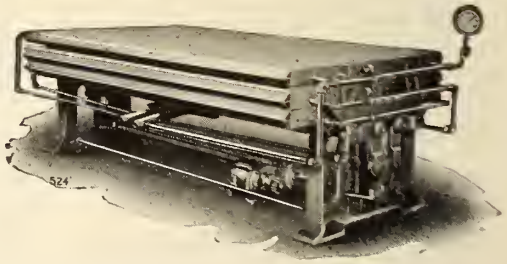
MESCO

It Pays to Install a "Merit" Re-drier



Bulletin No. 70-C.W.

Re-drying was not practiced to any extent 15 years ago when the "Merit" re-drier made its appearance on the market. Today very few glue rooms take a chance on veneer that has not been re-dried under hot plates and very few plants using veneer have neglected to install a "Merit" re-drier. This machine flattens the veneer and makes it absolutely bone dry. It takes very little steam and is operated by a 2 h.p. motor. It saves glue, simplifies taping and jointing and insures success in the finished product. It is made in several sizes of plate and starting with 4 plates, a machine can later be expanded to 12 or 16 plates.



The Three Plate Re-drier

The "Merit" Line

Veneer Lathes, Clippers, Driers and Re-driers

Plywood and Panel Machinery

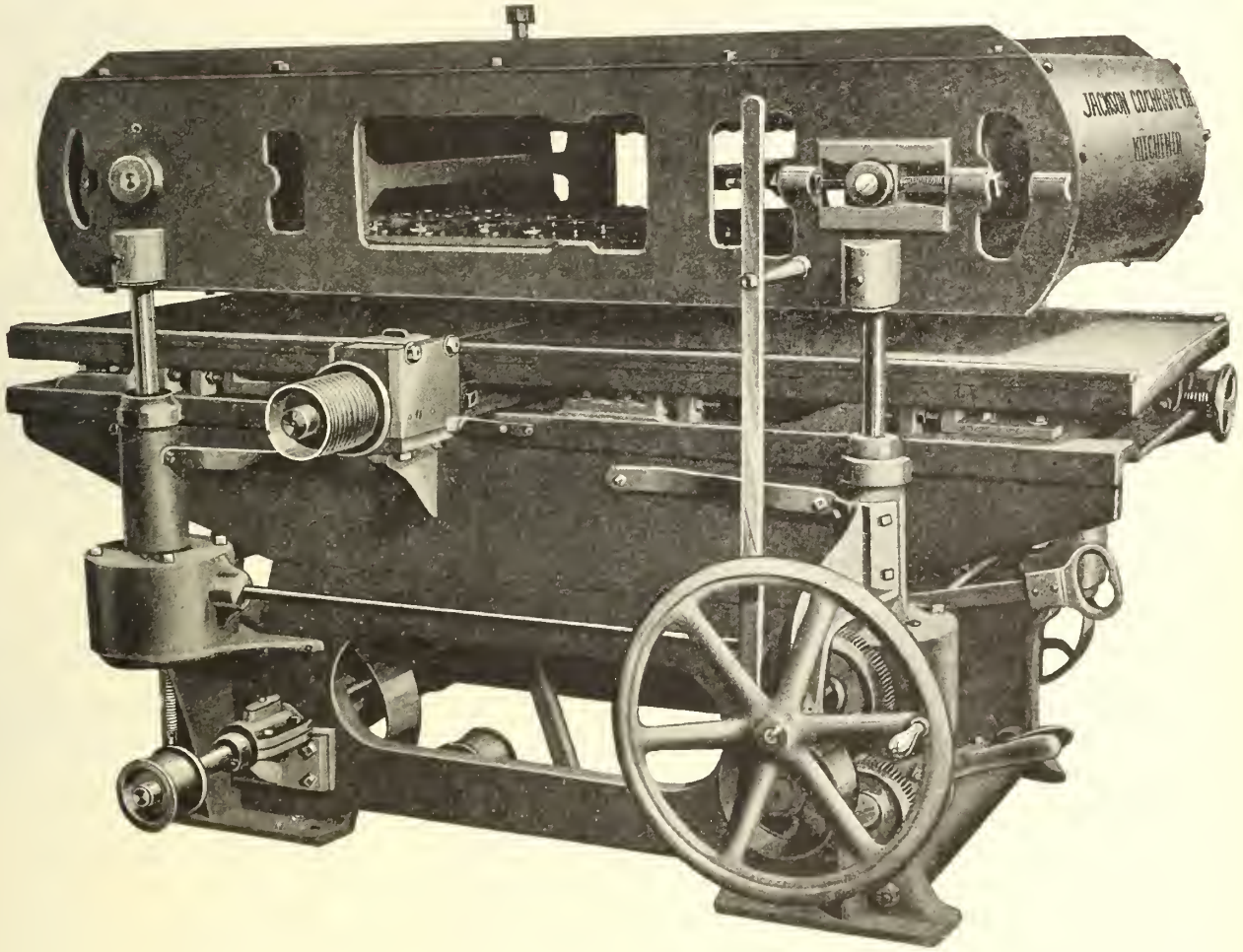
Basket and Crate Machinery

MERIT

"The Best Equipment Possible for the Work it is Intended to Do"

—*Says Panels, Limited*

of Southampton, Ont.



This machine not only increases production while lowering operating costs but entirely eliminates the dangers to which the operator of the old style buzz planer was subjected.

Just consider these facts:

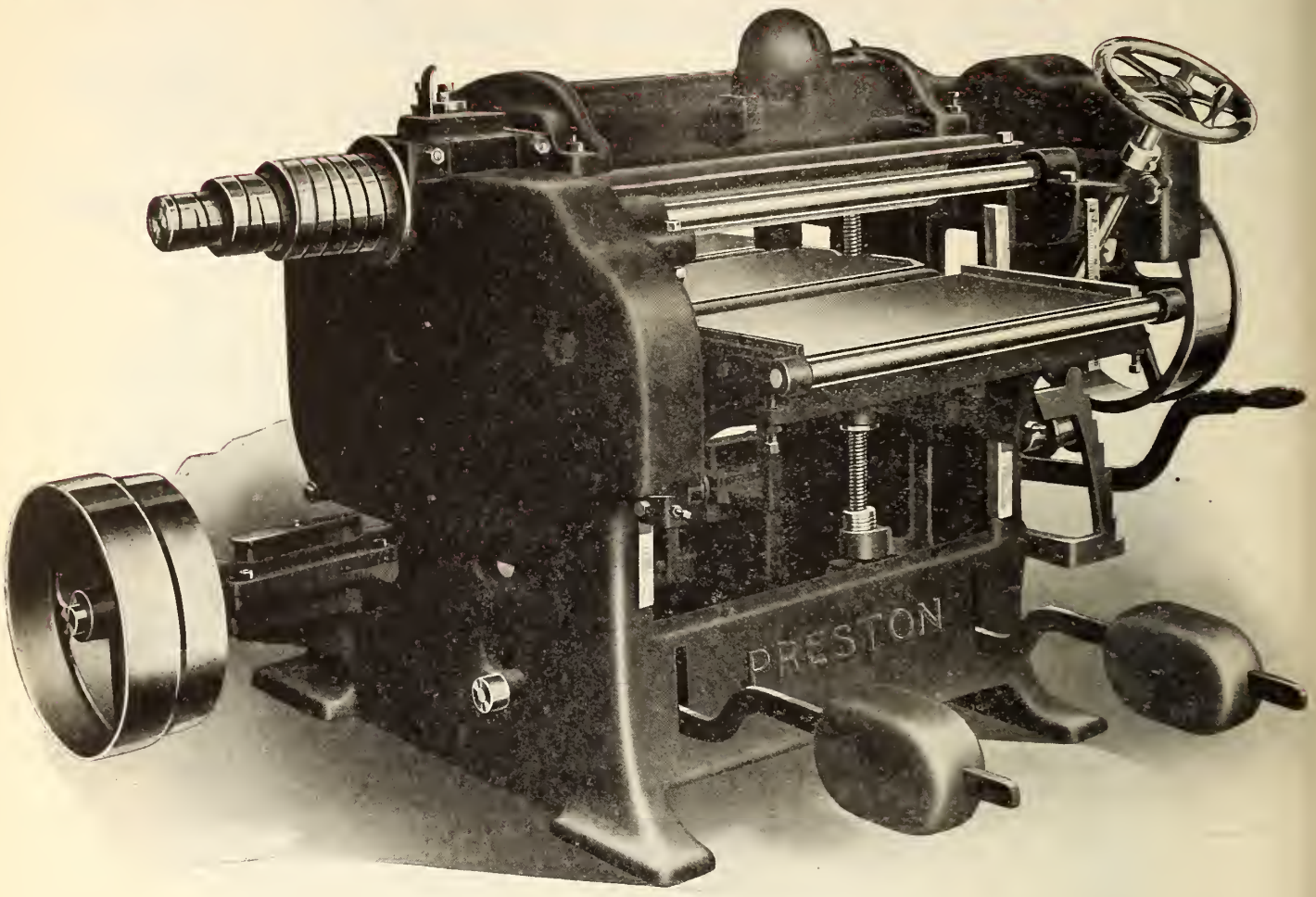
It handles stock of any dimension, hard or soft, at four times the speed of the old method; occupies but one fourth the space required by four hand jointers; requires but one-fifth of the sharpening of the knives as the hand fed jointer and is easily operated by two boys.

These facts we shall be glad to prove to anyone interested in such a machine.

Jackson, Cochrane & Company

KITCHENER - CANADA

No. 121 "Preston" Heavy Pony Planer



Cut Showing Standard Machine (note Guards)

This is our No. 121 Planer of improved design as now built

Planes 20″ and 24″ wide. 8″ thick

Features:—

1. Built with Straight Rolls (Standard Machine)
   or Divided Roll
   or Sectional Roll and Sectional Chipbreaker
2. Built with Square Cylinder with 2 carbon knives (Standard Machine)
   or Round Cylinder with 4 High Speed Knives.
3. Equipped with Whitney Type Babbitt Bearings (Standard Machine)
   or Specially selected SKF Ball Bearings.
4. Equipped with Stockbridge Electric Knife Grinder if desired, at extra cost.

Cylinder driven from one or both ends.

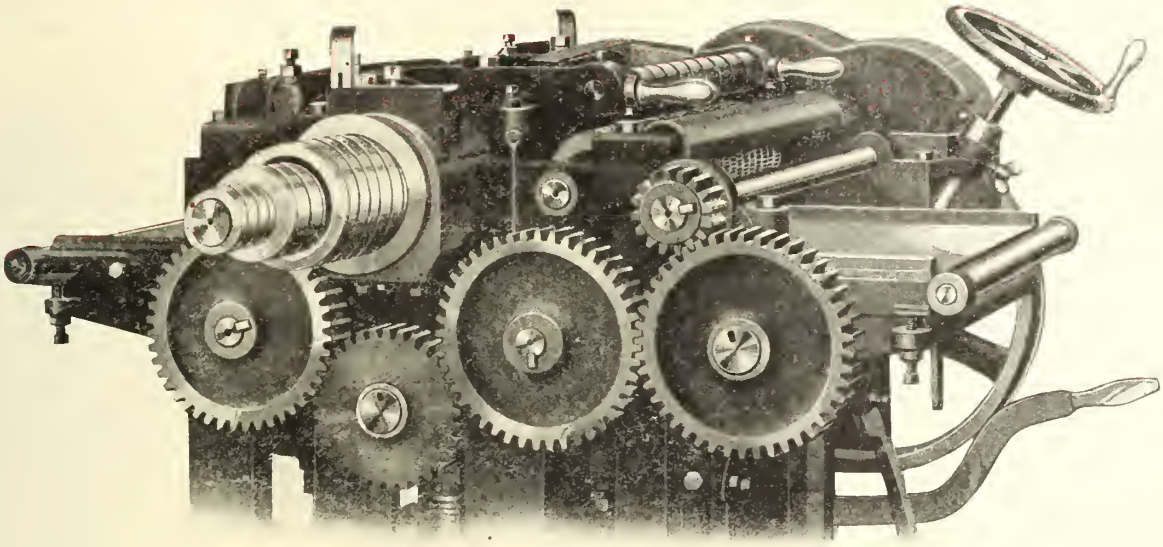
Every known improvement is embodied in this "Preston" Planer and in it we have produced a small planer which in quality and quantity of work produced will compete successfully with larger and higher priced machines

The Preston Woodworking

PRESTON,

We are Sole Manufacturers of and Agents in Canada for the Eaglesfield Patented Beltless Swing Saw

No. 121 "Preston" Heavy Pony Planer



Above cut shows Machine equipped with

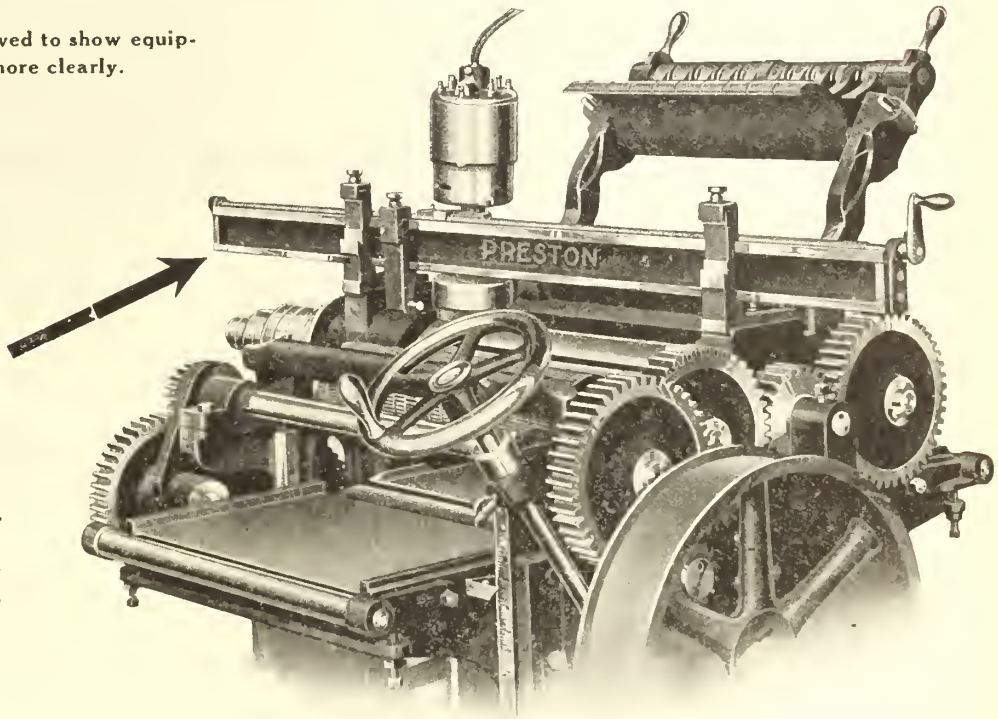
1. Specially selected SKF Ball Bearings.
2. Round Cylinder with 4 High Speed Knives.
3. Sectional Roll.
4. Sectional Chipbreaker.

N. B. Guards are removed to show equipment and construction more clearly.

Cut at right is same as above but shows machine equipped as well with

Stockbridge Electric Knife Grinder and Jointer

with which the Cylinder Knives are ground and jointed right in their place on the machine.



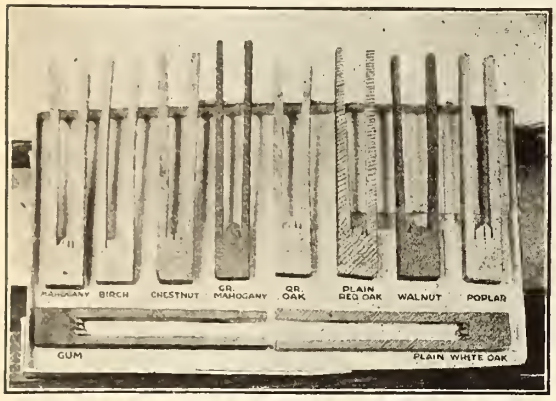
We would like to talk "Planer" to you whenever you are in the market

Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

Make these savings at your plant right away!



Globe-Wernicke Co., did this—9 different problems handled effectively—a box of test pieces all cut in one day showing splendid results. Nine different problems solved with their 16 Standard Dry Kilns. Get our literature on making these tests.

STOP MERELY TRYING—OTHERS DO IT!

It CAN be done; this shows an example. And one kiln of oak saved, or even one foot more on each board you dry—figure that out! Get straight lumber, free from case hardening. If your old klins won't do it as they stand, give us a description of them and have our expert immediately give them the "once over"—it's often only a matter of building in to them our valuable and effective features. And if you need new kilns, get ALL of our features. They produce results—it's time to stop wishing—rip into the trouble, we are helping the leaders—ask us what it will take to put you on this low-cost drying basis. Put your name on this—mail it back to us. Address us at 1542 McCarty Street, Indianapolis, Ind.

The Standard Dry Kiln Co.

Drudgery Demoralizes Men

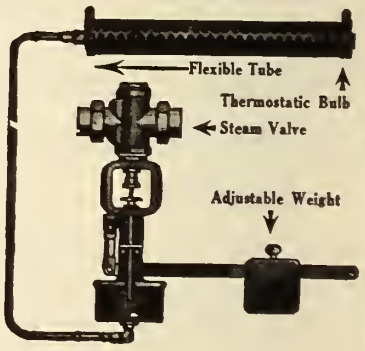
Put your men on jobs they like and you will go far toward solving the labor problem. For example, take the men off the drudgery of watching thermometers and turning steam valves.

Powers Heat Regulators

With these automatic guardians on the job, more men are released for work that is directly productive. Besides, you save fuel and materials and standardize your product. Powers Regulation is a necessity in most plants right now. Probably yours is no exception.

Here's a Fair Test—Try one for thirty days at our risk.

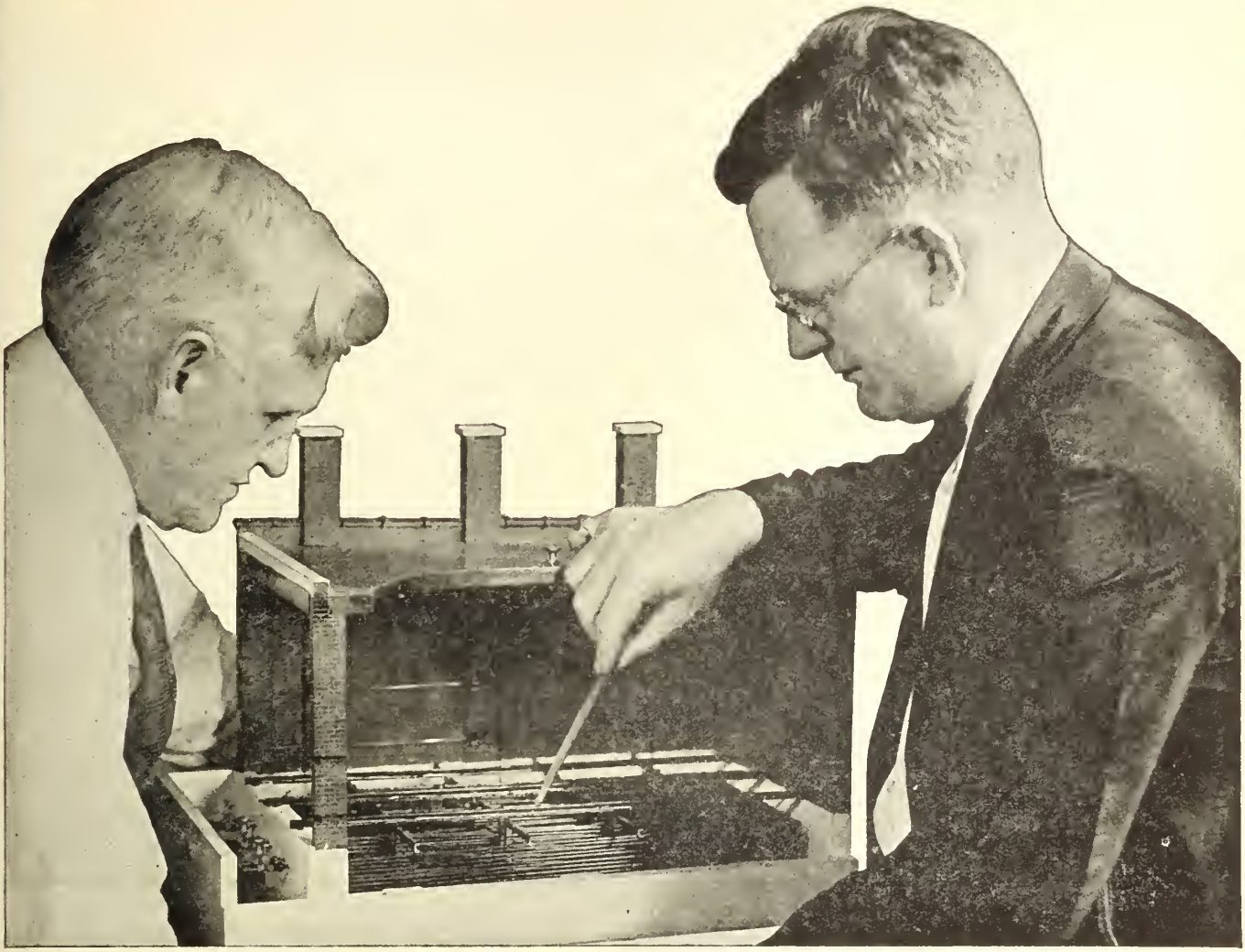
The Canadian POWERS REGULATOR Co. Ltd.
Specialists in Automatic Heat Control
82 CHESTNUT ST., TORONTO ONT.



The Powers Regulator No. 15

For control of air temperatures. The thermostatic bulb is so constructed that it may be placed at any point and in any position in the room to be controlled, and connected with the steam valve by a flexible tube, of any required length. It is very sensitive and reliable. Self-contained and entirely automatic. Particularly adapted to control temperatures in dry kilns, ovens, varnish and dry rooms, etc. Write for bulletin 138.

[1775]



Ira A. Minnick, President of The National Dry Kiln Company, is using his freckled right hand to show exactly how the National spraying system provides for the expansion of steam and a reduction of velocity so that the moisture from the spray will enter the room in the form of vapor rather than at the high velocity of the steam jet.

A "Close Up" of

The National Dry Kiln

Orders for National Dry Kilns recently received:

Globe Furniture Company, Ltd., Church Furniture, etc., Waterloo, Ont.

Victoriaville Furniture Co., Ltd., Furniture, Victoriaville, Que.

Jasper Novelty Works, Desks, Jasper, Indiana.

Kurtz Brass & Wood Bed Co., Corry, Pennsylvania.

The Lane Chair Factory, Keene, New Hampshire.

Ramseur Furniture Co., Furniture, Ramseur, N.C.

Readsboro Chair Company, Opera Chairs, etc., Readsboro, Vt.

Frankfort Chair Company, (State Penitentiary) Frankfort, Kentucky.

West Michigan Furniture Co., Furniture, Holland, Michigan.

Piggly-Wiggly Corporation, Store Fixtures, Jackson, Tennesssee.

will disclose many exclusive features that make it so nearly automatic that any operator of ordinary intelligence can get uniform results from lumber of varying thicknesses.

Our new catalogue is now ready for distribution. Send for a copy.

The National Dry Kiln Company

1117 East Maryland St. Indianapolis, Ind.

Branches: New York City; Memphis, Tenn.; Toronto, Canada

C. A. Fields, Can. Rep., P. O. Box 55, Toronto, Ont.

Alphabetical List of Advertisers

Adjustable Clamp Co. 107
Anderson Tully Co. 95
Atlantic Lumber Company 46
Atkins & Co., E. C. 119
Atlas Mfg. Co., of Orlando 105

Bachman Co., F. M. 92
Batavia Clamp Co. 107
Banning, Leland G. 49
Behr Co., Inc., Herman 75
Bigelow-Cooper Lumber Co. 47
Barr-Holaday Lumber Co. 35
Bell Machine Co. 15
Birds Eye Veneer Co. 78
Black Bros., Co. 26
Blocksom & Company 70
Bonner & Sons, J. H. 41
Bruce Woodworkers Ltd. 31
Bruce Company E. L. 49
Buffalo Hardwood Lumber Dealers 42
Bury & Co., Robt. 50

Calhoun Plywood Co. 39
Canada Machinery Corporation 1
Canada Wood Specialty Co. 46
Canadian Appraisal Co. Ltd., The 21
Canadian Blower & Forge Co. 108
Canadian General Lumber Co. 101
Canada Glue Co. 18
Canadian Nashua Paper Co. 32
Canadian Powers Regulator Co. 12
Canadian S. K. F. 111
Cannon Canadian Co. Ltd. 18
Connor J. H. & Sons Ltd. 46
Carborundum Co. 113
Carter & Co., E. T. 76
Casein Mfg. Co. 18
Celluloid Zapon Co. .....
Chapman & Dewey Lumber Co. 32
Clamp Nail Co. 105
Clarke Edward & Sons, Ltd. 44
Coignet Chemical Products Co. 18
Colborn, C. B. 40
Comfy Cushion Co. 71
Cosmos Chemical Co. 21
Cowan & Co. 16

Decorators Supply Co. 20
Delaney & Pettit Limited 72
Des Moines Sawmill Co. 36
DeVilbiss Mfg. Co. 77
Dominion Appraisal Co. 21
Doon Twines 72
Dry Kiln Door Carrier Co. 26

Eagle-Ottawa Leather Co. 70
Eaton & Sons, J. R. 30
Elliot Machinery Co. 117
Engineering & Machine Works of Canada Ltd. 116
Empire Tool Works 107

Farrin Lumber Co., The M. B. 50
Fay & Egan Co., J. A. 2
Foster, Merriam Co. 22

Gardiner P. W. 14
Garlock Machinery Ltd. 8
General Machinery Co. 103
General Hardwood Lumber Co. 31
Globe Vise & Truck Co. 115
Grand Rapids Vapor Kiln 108
Guelph Patent Cask. Co. Ltd. 85
Gulf Lumber & Trading Co. 41

Hafner Mfg. Co. 48
Hamilton Gear & Machine Co. 8
Hartzell, Geo. W. 37
Hay & Co. 93
Hay & Co., Peter 103
Hawker Mfg. Co., W. S. 25
Hoffman Bros., Co. 83
Hyde Lumber Co. 41

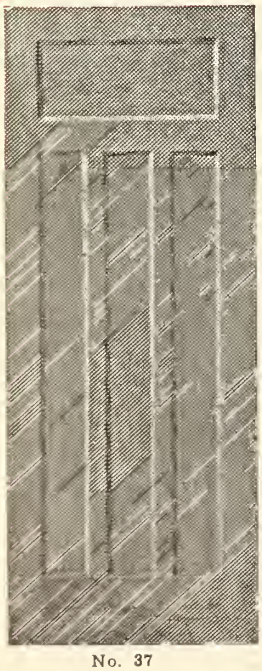
Ideal Fence & Spring Co. of Canada Ltd. . 71
Industrial Engineering Co. 115

Jackson Cochrane & Co. 9

Kane Mfg. Co. 20
Kasebier Chatfield Shellac Co. 26
Kinnon Lumber Co., Ltd. 103
Klise Mfg. Co. 24
Klotz Machine Co. 28
Kosse,Shoe & Schleyer Co. 45
Kraetzer-Cured Lumber Co. 99

TRADE MARK

GARDINER DOORS
Are Good Doors


No. 37

Manufactured—

White Pine No. 1 and Paint Grades
Chestnut, Veneered Oak and Birch

In Stock Designs and Stock Sizes
(Big stock available for prompt shipment.)

High Grade Sash and Verandah Columns
Mouldings and Interior Trim in Clear
White Pine, Georgia Pine and Chestnut

Our Motto—"Good Goods and Prompt Shipment."

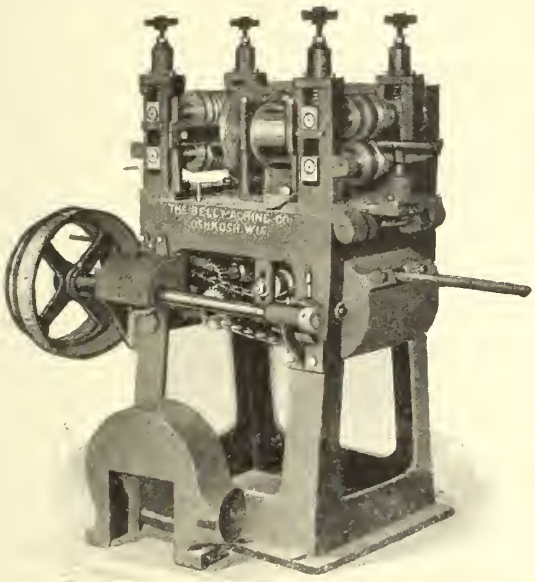
ASK FOR CATALOGUE NO. 7.
(Please refer to this advertisement)

P. W. Gardiner & Son, Ltd.
Telephone 146
GALT - - ONTARIO

No. 42

Make Your Own Dowels With the "BELL" Machines

The Fastest and Most Practical Equipment For the Purpose



Adjustable Rod and Dowel Machine

The fastest dowel machine in the world.

Constructed to withstand the heavy and constant strain to which this type of machine is subjected.

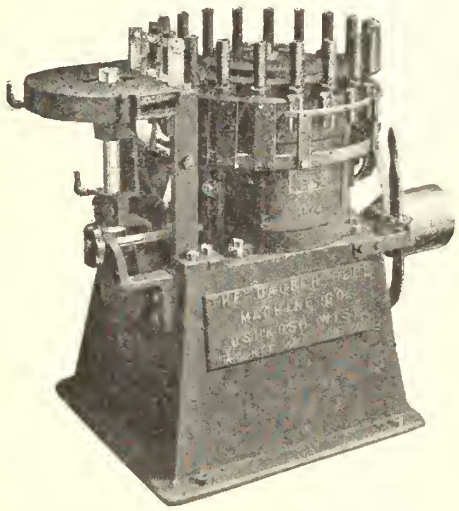
Equipped with a universal four-knife cutter head adjustable to turn rods of all diameters from ¼" to 2" in either plain, spiral groove, longitudinal groove, or imitation reed wind. Special machine for turning rods of larger size.

Cutter-head mandrel is mounted at each end in ball-bearings of the highest grade.

Out-going feed rolls have combination of grooves so that many sizes can be made without changing feed rolls. The in-going feed rolls are adjustable for all sizes of squares.

Will work stock as short as 4½ inches.

Furnished with countershaft or motor drive.



Dowel Cutting Off and Pointing Machine

This machine is for cutting off and pointing dowel pins from long rods.

It will cut and point dowel pins of all diameters up to ¾", and in any length up to 6 inches.

Capacity of this machine is from 300 to 400 pins a minute. Any boy can operate it.

All working parts are completely enclosed and thus protected from dust and dirt.

Absolutely no danger to operator.

The floor space required by this machine is only 22" x 36".

Tight and loose pulleys on machine.

Furnished with belt or motor drive.

MANUFACTURED BY

The Bell Machine Company

(Successors to the Dauber-Bell Machine Co.)

Oshkosh, Wisconsin, U.S.A.

Representatives:

For Great Britain: THE OLIVER MACHINERY CO., 201 Deansgate, Manchester, England

For Canada: THE A. R. WILLIAMS MACHINERY CO. LTD., Montreal, Toronto, Winnipeg

Alphabetical List of Advertisers—Continued

Laidlaw Bale-Tie Co. 108
Larson & Shaw Ltd. 105
Litton Veneer Co. 81
Liverpool Hardwood Co., Inc. .....
Long-Knight Lumber Co. 93
Luehrmann Hardwood Lumber Company, Chas. F. 34

Marietta Paint & Color Co. 72
Mattison Machine Works 120
May Hardwood Co., R. R. 34
McDonagh Lumber Co. 39
McKenzie Machinery Co. 7
McKnight & Son Co., L. G. 118
Memphis Bandmill Co. 35
Memphis Veneer & Lumber Co. 83
Mercereau Hawkins Tie Co. 32
Merritt Engineering & Sales Co. 8
Mohawk Veneer Co. 83
Monite Glue 19
Morgan Machine Co. 117
Mowbray & Robinson 38
Munising Woodenware Co. 85
Murrelle Lumber Co., L. D. 41

Nash, J. M. 118
National Dry Kiln Co. 13
National Hardware Co. 105
National Patent Reed Sales Co. 26
Nichols & Co., A. S. 77
Northwestern Cooperage & Lumber Co. ... 81

Oakey & Sons, John 26
Ober Manufacturing Co. 107
Ohio Veneer Company 81
Oliver Machinery Co. 118
Oriental Textiles Co. 71
Otis Mfg. Co. 43
Overton, S. E. 24

Pedwell Hardwood Lumber Co. 30
Penrod-Jurden Co. 84
Penrod Walnut & Veneer Co. 84
Perkins Glue Co. 17
Petrie Ltd., H. W. 115
Pettingell Machine Co. 103
Pickrel Veneer Co. 29
Porter Machinery Co., C. O. 118
Preston Woodworking Mach. Co 10-11
Purcell Walnut Lumber Co., Frank 38

Radcliff Saw Mfg. Co. .....
Reese-Sheriff Lumber Co. 45
Reynolds Machine Co. 104
Richards Hardwood Co. 30
Richards-Wilcox Canadian Co. 103
Rush Lumber Co. 39

Shantz, P. E. 28
Shimer Cutter Head Co. 7
Shurley Dietrich C. 4
Sidmans of Canada The 101
Simonds Canada Saw Co. 119
Smith Lumber Co., Payson 34
Sondheimer Co., E. 47
Standard Dry Kiln Co. 12
Standard Veneer Co. 83
Stark & Co., Jas. E. 39
Steels & Hibbard Lumber Co. 39
Stimson & Co., J. V. 40
Stimson Hardwood Co., J. V. 33
Stimson Veneer & Lumber Co. 33
Sturtevant Co., B. F. 109
St. Joseph Iron Works 4

Taylor Mfg. Co., Jas. L. 104
Thomas & Proetz 31
Toronto Veneer Co. 91
Toronto Hardwood Lumber Co. Ltd. 91
Turner-Farber-Love Co. 97

Vail Cooperage Co. 34
Veneer Manufacturing Co. 85

Waddell Mfg. Co. 24
Walter & Sons, J. 23
Watertown Table-Slide Co. 28
Wayne Lumber Co. 40
Willey Co., C. L. 89
Williams Machinery Co., A. R. 6
Williamson Veneer Co. 86
Wisconsin Veneer Co. 81
Wood Mosaic Co. 87
Wylie Mathew 6

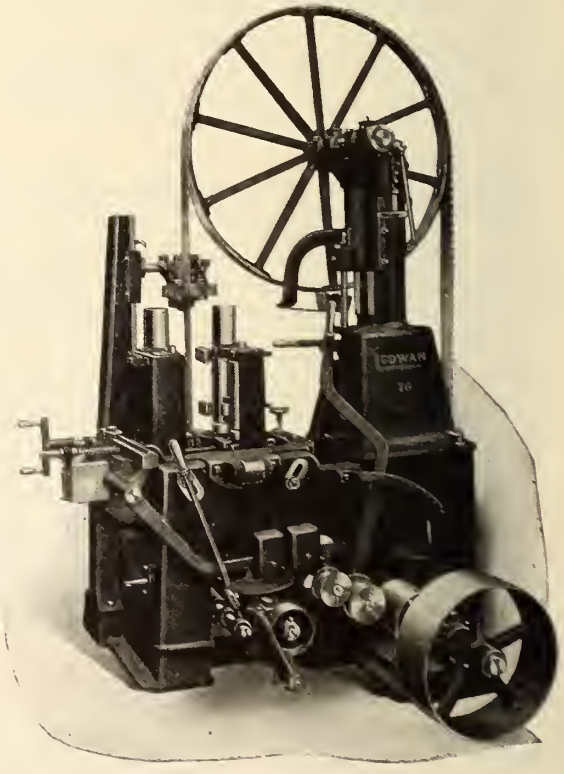
Yates Machine Co., Ltd. P. B. 5
Yellow Poplar Lumber Co. 48
Young Lumber Co., Bedna 40

COWAN BAND RESAWS

The Most Satisfactory

42," 48", 54" and 60" Wheels
Various Capacities

Particulars and prices furnished on request



Cowan & Company of Galt
Limited

Galt - - Canada

PERKINS
183
Trade Mark
Reg. U.S. Pat. Off.

PERKINS
183
Trade Mark
Reg. U.S. Pat. Off.

Quality --- Comfort Economy

Quality is the watchword that guards the manufacture of Perkins Glue.

Comfort is the token by which it commends itself to the workmen.

Economy is the characteristic which insures its welcome wherever it is given a trial.

Perkins Glue Company

Factory and General Offices
LANSDALE, PENNSYLVANIA

Sales Office
SOUTH BEND, INDIANA

Patents covering Perkins Glue have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS
183
Trade Mark
Reg. U.S. Pat. Off.

PERKINS
183
Trade Mark
Reg. U.S. Pat. Off.

WATCH FOR THE BULL DOG

UNIFORMITY

When used in describing a **Cannon Glue** is more than a claim. It is an established **fact!**

We have customers in Canada who have used one brand for fifteen to twenty years without one cause for complaint.

CANNON CANADIAN CO., LTD.
TORONTO **MONTREAL**

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

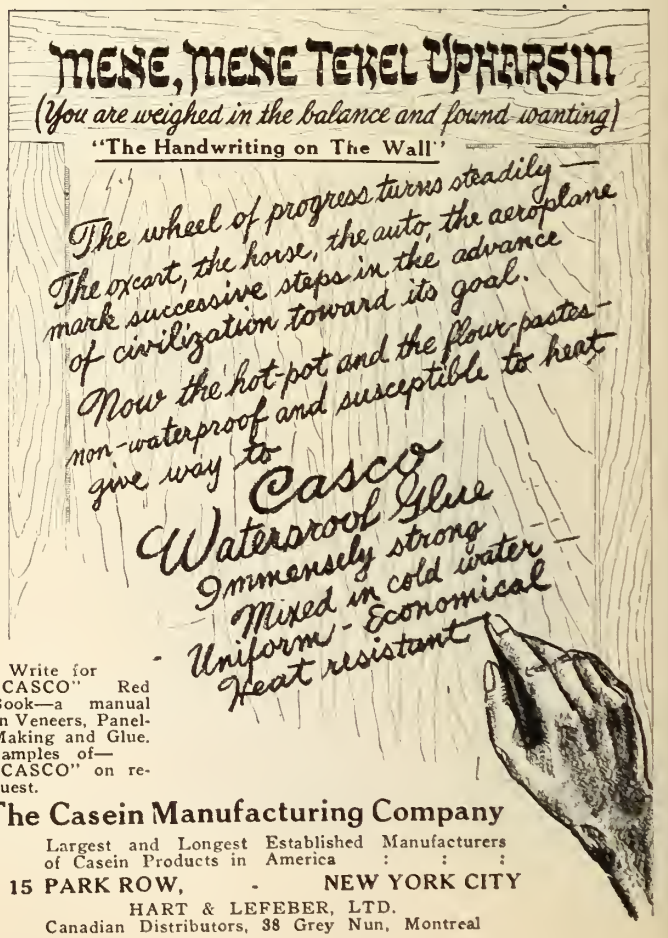
Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

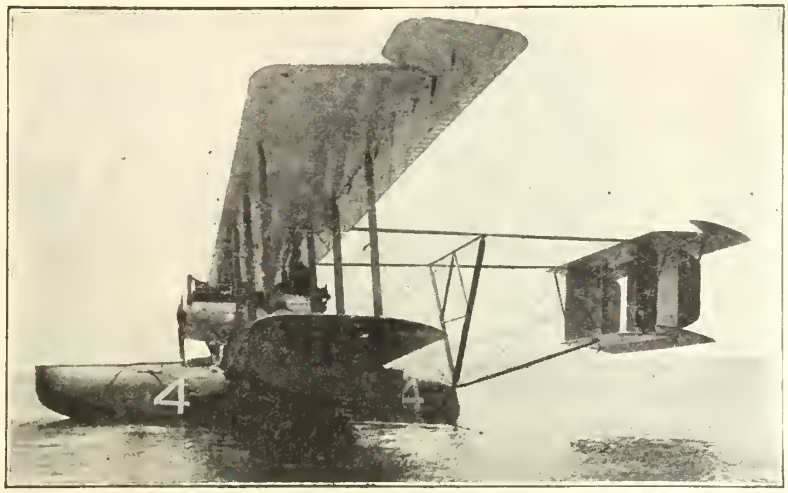
Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY
17 State Street NEW YORK CITY


MENE, MENE TEKEL UPHARSIN
(You are weighed in the balance and found wanting)
"The Handwriting on The Wall"
The wheel of progress turns steadily —
The oxcart, the horse, the auto, the aeroplane
mark successive steps in the advance
of civilization toward its goal.
Now the hot-pot and the flour-pastes —
non-waterproof and susceptible to heat,
give way to
Casco
Waterproof Glue
Immensely strong —
Mixed in cold water —
Uniform - Economical
Heat resistant

Write for "CASCO" Red Book—a manual on Veneers, Panel-Making and Glue. Samples of— "CASCO" on request.

The Casein Manufacturing Company
Largest and Longest Established Manufacturers of Casein Products in America : : :
15 PARK ROW, - NEW YORK CITY
HART & LEFEBER, LTD.
Canadian Distributors, 38 Grey Nun, Montreal



The famous N.C.-4, first airship to fly the Atlantic, photographed in the harbor at Ponta Delgada, Azores, in May, 1919—just after her flight across the Ocean from Labrador.

MONITE
Waterproof
Glue

Made from casein, is a necessity in the construction of the modern hydro-aeroplane. MONITE WATERPROOF GLUE stood the test of trans-Atlantic flight—and is used by the Army and Navy to-day—because MONITE sticks.

Made Trans-Atlantic Flight Possible

The N.C.-4, flagship of Lieutenant Commander John Reed, U.S.N.—the modern Christopher Columbus who first flew the Atlantic—was built with **Waterproof Glue.**

The engine-bases of the N.C.-4, to which her three high-powered gas engines were bolted, could not be made of steel or aluminum, for metals crystallize too quickly under the terrific vibration of such motors. They were, therefore, made of wood about three inches thick, built up of 20 very thin layers of plywood with the grain of the wood well criss-crossed and all 20 layers solidly glued with Waterproof Glue.

Struts, braces, framework, fusilage and even the plywood hull planking, all glued with Waterproof Glue, withstood the terrific jarring of the engines, the wrenching and twisting of 100-mile-an-hour flying through ocean winds, the impact of alighting and the hammering waves of the open sea.

Monite waterproof Glue endured the extremes of temperature from the cold, foggy upper air of Labrador to the semi-tropical atmosphere of the Azores. It was proof against the drying action of ocean sun and against the soaking, smothering swirl of white water kicked up at "the getaway" and the drowning splash of the landing "dive."

The triumph of **Monite Waterproof Glue** in its crucial trans-Atlantic test needs no further evidence—the U.S. Navy today specifies Waterproof Glue for hydro-aeroplanes and also for its small boats.

Monite Waterproof Glue opens up new uses and new markets for glue-made products—for manufacturer and retailer. We will be glad to suggest what it can do for YOU.

Write us for a "vest-pocket" panel of MONITE for you to test by boiling, soaking, and baking. Find out that MONITE STICKS.

MONITE WATERPROOF GLUE CO.

MANUFACTURERS OF COLD GLUE IN POWDERED FORM

1628 N. 2nd Street MINNEAPOLIS, MINN.

Canadian Representatives:

W. H. CUNNINGHAM & HILL, LTD., 269 Richmond St., W., TORONTO, CANADA

STOCKS AND REPRESENTATIVES IN ALL PRINCIPAL CITIES.

KANE VEGETABLE GLUE

Increasing sales, gaining steadily, seem to show that our policy is sound, and is endorsed by the buying public.

Also

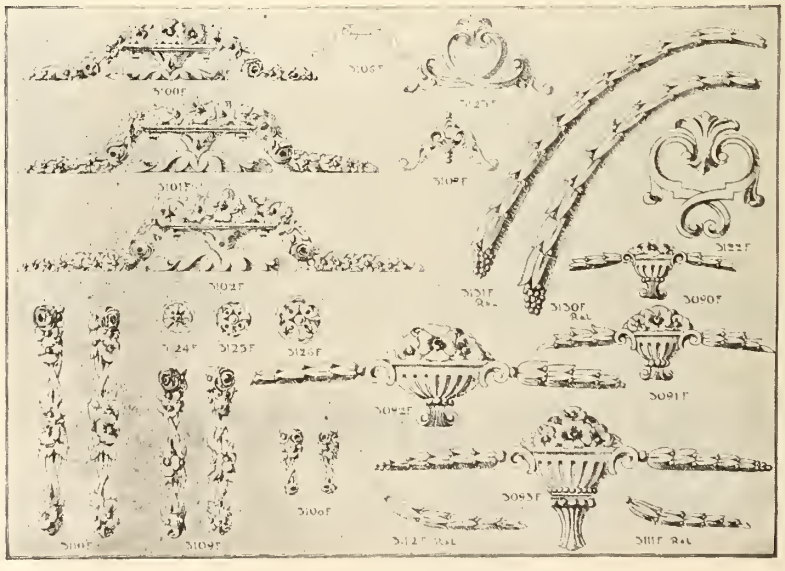
Kansine Waterproof Glue

KANE MANUFACTURING CO.

1832-34 South Clark Street CHICAGO, ILL.

PERIOD CARVINGS *for* FURNITURE

Largest Manufacturers of Imitation Wood Carvings in the World Quality the Best. Prompt Shipments



Unlimited Facilities for Manufacturing High Grade Wood Carvings in Composition and Wood Fibre

Reproductions of Exclusive Designs Our Specialty

THE DECORATORS SUPPLY CO.

2543 ARCHER AVENUE, CHICAGO

New Catalog Sent on Request

A Better FINISH

You can improve the appearance and durability of your finishes and increase the saleability of your furniture by using

Cosmos High Grade Lacquers and Lacquer Enamels

Lacquer gives a permanent, waterproof surface that is tough and durable.

It dries rapidly, increasing the output of the finishing department. Successive coats may be applied at half-hour intervals, enabling work to be finished in one day.

Samples, prices and other particulars gladly furnished.

Our Specialties:

METAL LACQUERS
WOOD LACQUERS
ENAMELS
BRONZING LIQUIDS
EUREKA AIR BRUSHES
AMYL-ACETATE
REFINED FUSEL OIL
COLLODION
BRONZE POWDERS
MATCHLESS METAL POLISHES AND BUFFING COMPOSITIONS
BANANA OIL

Cosmos Chemical Company
Port Hope Ontario

The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5.000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

Dominion Appraisal Company Limited

The Test of An Appraisal

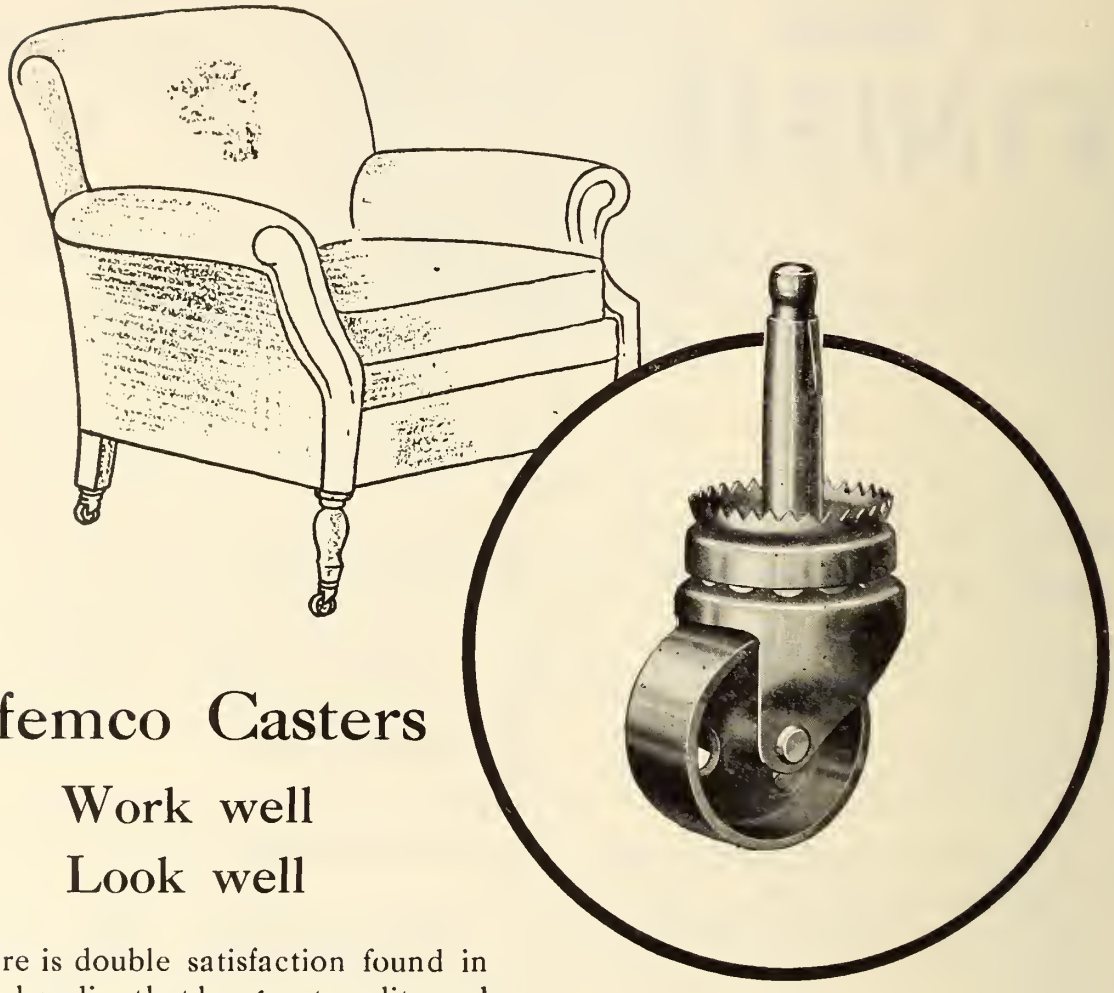
"We have never been so grateful for anything we have done as for the appraisal made by you in December 1919. It certainly was worth thousands of dollars to us in the adjustment of the fire."

Port Arthur Daily News Limited
May 5th, 1921

Our staff of qualified appraisers—men with many years experience in the appraisal field—and our system of careful supervision of all work entrusted to our care has afforded protection to our large clientel extending throughout the Dominion of Canada.

We solicit your correspondence

8-10 Wellington Street East
TORONTO, NTO.
Telephone Main 646.



Efemco Casters

Work well
Look well

There is double satisfaction found in merchandise that has great quality and at once is good looking.

It's the same with casters like **Efemco**. They work every time and all the time. They never bind or jam and always roll easily. At the same time they are good looking and add much to the piece that they equip.

The salesman is proud to say that the furniture in hand is fitted with **Efemco** Casters.

A kind for every use.

Send for our latest catalog

FOSTER, MERRIAM & CO.

Meriden, Conn. **Hamilton, Ontario** **New York City**

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters

Roller Bearing Casters
Truck Casters
Automobile Accessories

Piston Rings
Grey Iron Castings

Standardized by 57 years of service.

Correct in Design

Reasonable in Price

For many years the European Masters of Decoration have developed ornamentation to a high degree. It is this high standard which they have set that we use as our guidance.

In offering you our services we do so with the knowledge that the final Result will not be a guess at what is correct, but rather the result of years of experience in decoration.

The two drops above are of our many new designs and are half size. Until our new catalog is issued write in for your requirements. Give us a general idea of what you require, it may be among our many new patterns.

We are always ready and glad to work from your suggestions.

Co-operation is the order of the day.

JOHN WALTER & SONS LIMITED

KITCHENER :-: ONTARIO

S.E.OVERTON CO.
"Our Quality Is Always Higher Than Our Price"
ARTISTIC WOOD CARVINGS

WE specialize in the manufacture of high grade wood carvings, wood turnings and specialties.

Our highly skilled organization and improved equipment permit us to produce highly finished carvings in any quantity, promptly and economically.

Our prices are satisfactory—write for them.

S. E. OVERTON
COMPANY
SOUTH HAVEN
MICHIGAN U.S.A.

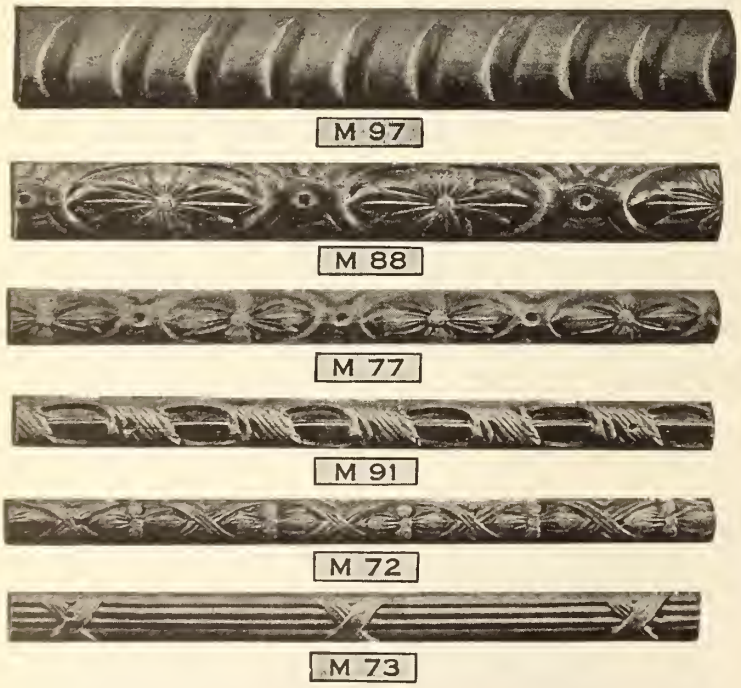
CARVED MOULDINGS, CARVINGS, CARVED LEGS

No. D-775 (Reduced One-Half)

No. D-763 (Reduced One-Half)

"KLISE" mouldings are carved, not pressed. Made in several hundred classic, period designs, in various sizes and shapes. Catalogue of legs and samples of mouldings sent on request. Send us your designs or samples of carvings for quotation.

KLISE MANUFACTURING COMPANY
Grand Rapids, Michigan



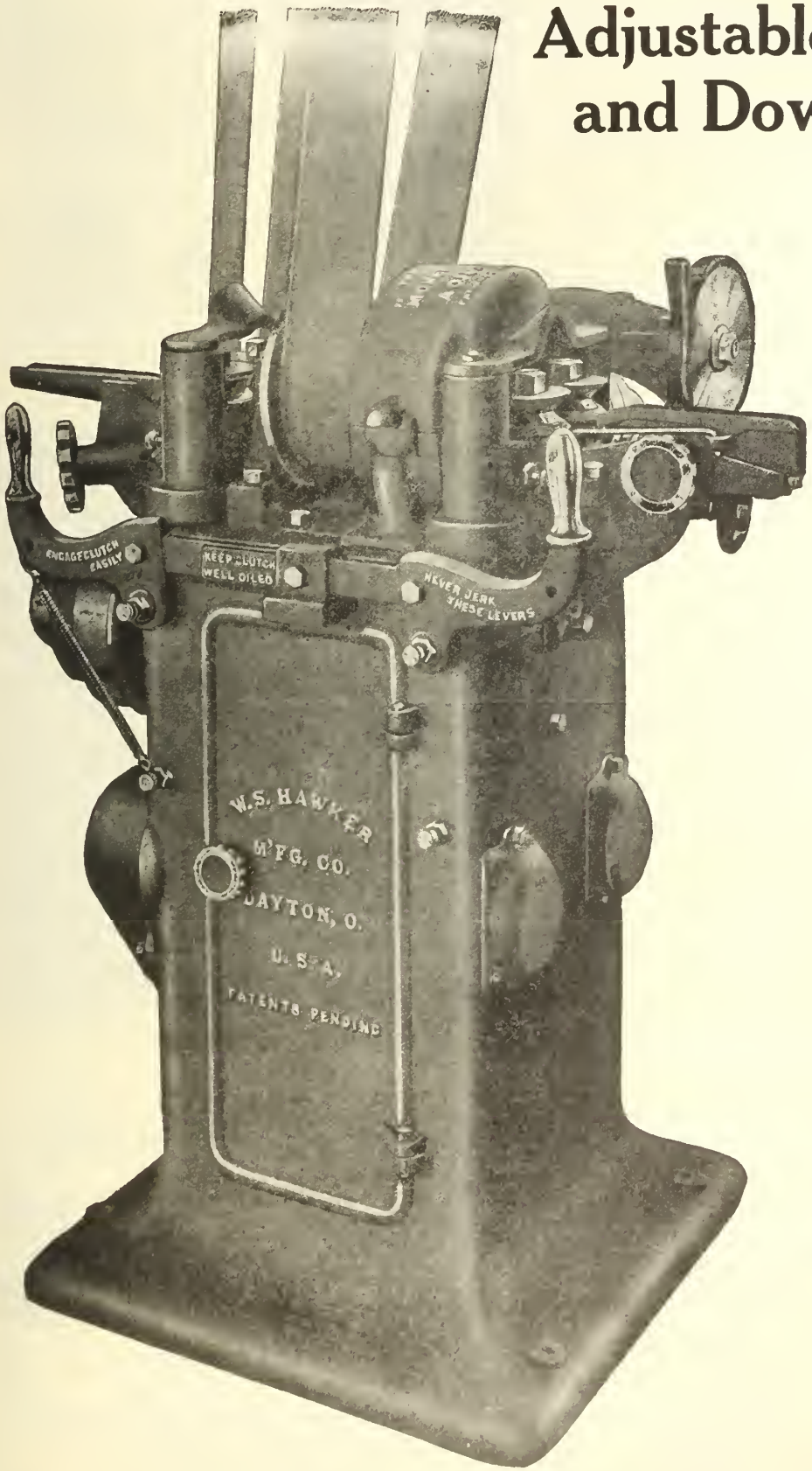
MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

Waddell Manufacturing Company
Coldbrook and Taylor, N. W. Grand Rapids, Mich.

The Money Maker— Adjustable Rod and Dowel Machine



Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely
Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio

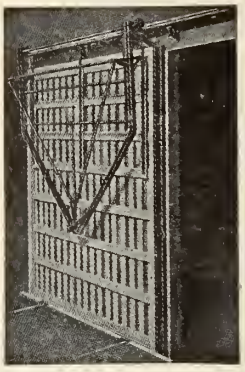
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN
DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

TO GET THE BEST

Use

Kasebier Quality

KASEBIER-CHATFIELD SHELLAC CO.
KASEBIER QUALITY GUARANTEED
EST 1881
BLEACHED SHELLAC
KASEBIER QUALITY HAS EARNED ITS REPUTATION. THIS LOT WAS MADE WITH THE DETERMINATION TO KEEP IT
NEW YORK, N.Y.

Guaranteed

Kasebier-Chatfield Shellac Co.
No. 7 Cedar St., N. Y. C.

FIBRO-KANE
PATENTED
OPEN WEBBING

NATIONAL PATENT REED
SALES COMPANY
DREXEL BUILDING
PHILADELPHIA, PA.

OAKEY'S
Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

JOHN OAKEY & SONS LTD.,
WELLINGTON EMERY AND BLACK LEAD MILLS
LONDON, S. E. 1.

Canadian Agents:

P. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

Using a Hundred Papers Where One Would Do Better

IF you wished to reach every electrical man in every town in Canada—engineers, dealers, designers, manufacturers, central station operators; you could do so by using a hundred odd local daily and weekly papers. But if you wished to reach these same men economically and at a time when they were thinking business—not golf and home—you would use just one publication and that would be the national publication:

Electrical
Engineering Contracting **News** Merchandising Transportation
Every Two Weeks Since 1891

A Circulation of 3000 Regular Buyers

Lowest Rate per Interested Reader

Hugh C. MacLean Publications

Electrical News
Canada Lumberman
Footwear in Canada
Canadian Woodworker
Western Contractor and Builder
Contract Record & Engineering Review
Commercial & Retail Merchants' Review
Furniture World
Western Lumberman
Western Coal Review

Head Office: 345 West Adelaide Street

Vancouver Chicago Toronto Montreal Winnipeg

The largest publishers of technical papers in the British Empire, printing in Toronto, Winnipeg and Vancouver. Proprietors of MacLean Building Reports Limited.

Watertown Table-Slide Company

Watertown, Wisconsin U.S.A.

Table slides are the vital part of any dining table. Why not use the best and make it a good selling point? Full details and prices gladly forwarded.

Manufacturers of the famous Roller-Bearing Equalizer Slides.

Look for Your Guarantee

PUBLISHING HOUSE of HUGH C. MacLEAN

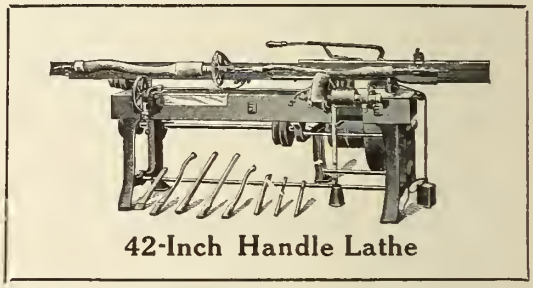
For it's your protection against uninteresting reading.

Enquiries welcomed

Hugh C. MacLean Publications
LIMITED
345 Adelaide Street West, Toronto

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.

We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

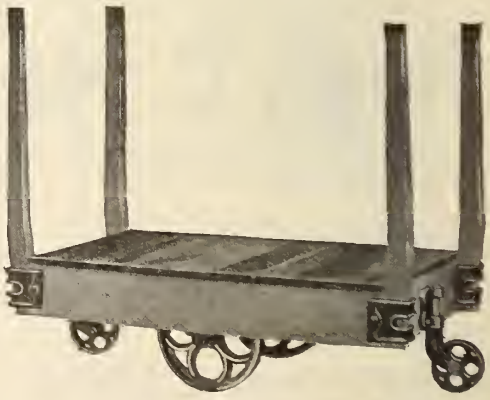
MANUFACTURED BY
Klotz Machine Co., Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

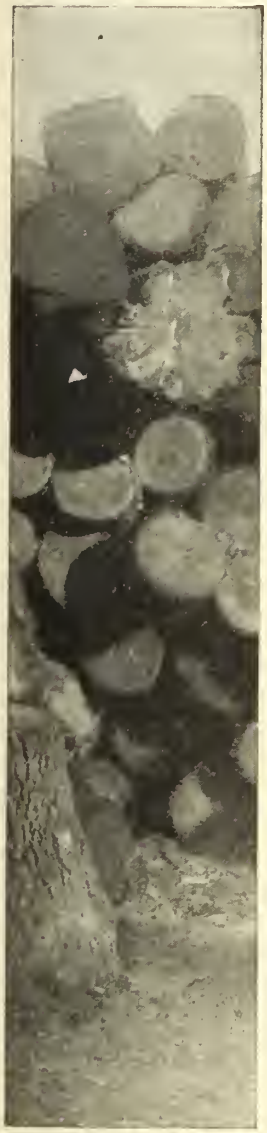
FACTORY TRUCKS

Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY
P. E. SHANTZ, PRESTON, ONTARIO.



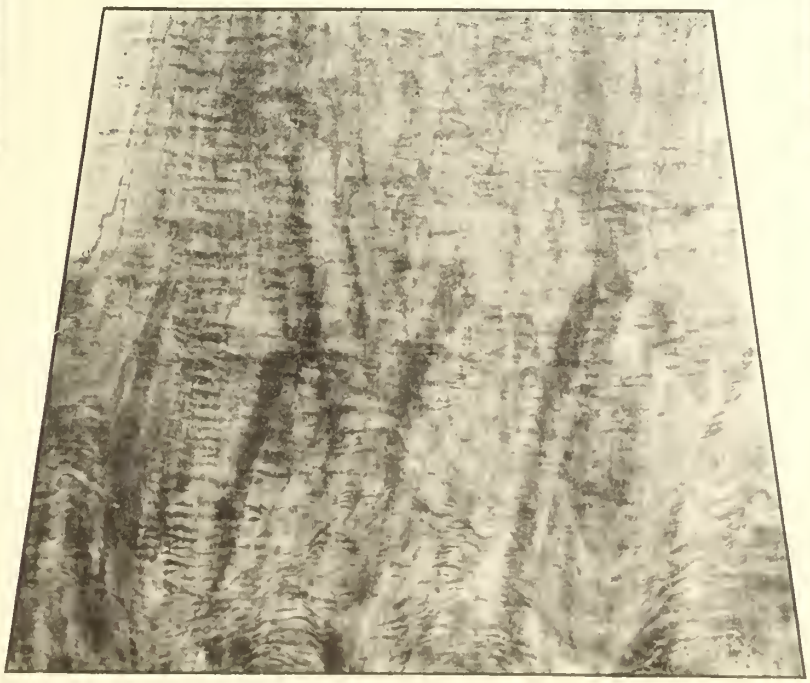
Factory Truck Style No. 26.



Walnut?—Yes,—Good Walnut?—Yes!
Pickrel

Walnut's sheer beauty, strength, uniformity and permanence brought it in a few years to unquestioned supremacy in furniture construction. Dominance in furniture proves but the beginning. This surpassing merit is every day compelling increased use in new cabinet fields. Pickrel walnut veneers fill an important place in this wider development. A limitless selection of quality veneer logs, careful and skilled manufacture and a constant stock of five million to seven million feet of nicely assorted woods have given Pickrel walnut veneers a special significance. Buyers will appreciate the responsible, conscientious and experienced representation through which Pickrel veneers are offered at their respective plants. It assures the closest possible conformity to the individual requirements of each—meaning less cost in working and a better product.

PICKREL VENEER CO.
New Albany, Indiana



The Pedwell Hardwood Lumber Company

FOOT SPADINA AVENUE : : TORONTO

Full or mixed cars for immediate delivery

HARD and SOFT MAPLE **ROCK and SOFT ELM**
BEECH BIRCH and BASSWOOD

Hardwoods in 4 x 4, 4 x 6, 1″ and 2″. No. 3 Common.

Why not get in touch with us?

H. J. RICHARDS J. T. KENDALL

Richards Hardwood Company

746-7 BANK OF COMMERCE BUILDING

Memphis, Tennessee, U. S. A.

Successors to Dacus-Richards Hardwood Co.

We make a specialty of catering to the Canadian trade and are in position to make reasonably prompt shipment of practically any Southern Hardwoods which you are needing. Your orders and inquiries will be highly appreciated and will receive our prompt and personal attention.

Specializing in Delta Red and Sapgum, Oak, Elm and Poplar.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

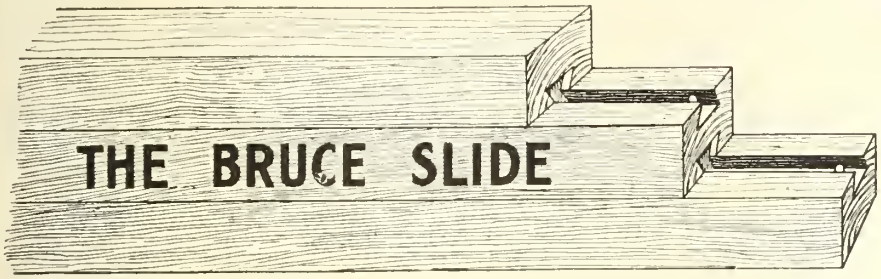
Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

TABLE SLIDES TABLE RIMS TABLE PINS



Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

Thomas & Proetz Lumber Co.

3406 Hall St.
ST. LOUIS, MO.

MANUFACTURERS of OAK AND GUM

As well as all other Southern Hardwoods

LET US HAVE YOUR INQUIRIES

BELZONI, MISS. —— MILLS —— CALION, ARK.

GENERAL HARDWOOD LUMBER COMPANY

SOUTHERN AND NORTHERN HARDWOODS
118 North La Salle Street
CHICAGO

Quick shipments assured, together with quality stocks.
Kindly favor us with your enquiries.

Mercereau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

CANADIAN NASHUA PAPER CO. LTD. — SERVICE PERFECTION — NASHUA — QUALITY — TRADE MARK — PETERBOROUGH ONT.

Buy Nashua Veneer Tapes

(Paper and Cloth)

QUALITY SUPREME

SERVICE UNEQUALLED

THE CANADIAN NASHUA PAPER CO., Ltd.

Peterborough, Ont.

A Thirty-Five Years' Unbroken Record of Fulfilling Sales Contracts Regardless of Market Changes

AT all times it is important that buyers of Southern Hardwoods look well into the **reliability** of the lumber manufacturers they deal with. It is doubly important in such times as these when the market is advancing. There are strong indications of further advances and buyers should protect themselves by placing their orders with concerns who can be relied upon to execute and fill their orders in an advancing market; who can also furnish stock fully up to grade under any condition.

The Chapman & Dewey Lumber Company has the reputation of never having failed to fulfill a sales contract regardless of the market. This is an unbroken record extending over 35 years.

Wire Our Expense for Quotations

Chapman & Dewey Lumber Company

Everything in Southern Hardwoods

Mills: Marked Tree, Ark.

940-950 Bank of Commerce Bldg. MEMPHIS, TENN.

Branch Office: Kansas City, Mo.

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" Fas.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

QUARTERED RED OAK
- 5 cars 4/4" Fas.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.

QUARTERED RED GUM
- 5 cars 4/4" Fas.
- 2 cars 4/4" Fas. Fig.
- 2 cars 5/4" Fas.
- 2 cars 6/4" Fas.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM S.N.D.
- 5 cars 5/4" No. 1 Com. & Btr.
- 5 cars 6/4" No. 1 Com. & Btr.
- 10 cars 8/4" No. 1 Com. & Btr.

ASH
- 4 cars 10/4" No. 1 Com. & Btr.
- 1 car 12/4" No. 1 Com. & Btr.
- 1 car 6/4" No. 1 Com. & Btr.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.
- 1 car 5/4" No. 1 Com. & Btr.

SAP GUM
- 10 cars 4/4" Fas.
- 3 cars 5/4" Fas.
- 3 cars 6/4" Fas.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 5 5/4" No. 1 Common.
- 5 cars 6/4 No. 1 Common.

PLAIN RED OAK
- 2 cars 4/4" Fas.
- 3 cars 5/4" Fas.
- 3 cars 6/4" Fas.
- 2 8/4" Fas.
- 10 cars 4/4" No. 1 Common.
- 5 cars 5/4" No. 1 Common.
- 5 cars 6/4" No. 1 Common.

PLAIN WHITE OAK
- 4 cars 4/4" No. Com. & Sel.

COTTONWOOD
- 2 cars 4/4" Fas.
- 10 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

ASH
OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

DRY STOCK

For Immediate Shipment

	SOFT ELM	
6905′	1″	—No. 1 C&B
3195′	1″	—No. 2 Com.
41030′	1½″	—No. 1 C&B
2356′	1½″	—No. 2 Com.
56880′	2″	—No. 1 C&B
10046′	2″	—No. 2 Com.
110594′	2½″	—No. 1 C&B
26985′	2½″	—No. 2 Com.
11750′	3″	—No. 2 Com.
	WHITE ASH	
87846′	2″	—No. 1 C&B
3072′	2″	—No. 2 Com.
139960′	2½″	—No. 1 C&B
13537′	2½″	—No. 2 Com.
18992′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.
	HICKORY	
650′	1″	—No. 1 C&B
1408′	2″	—No. 1 C&B
	COTTONWOOD	
1620′	1″	—No. 1 C&B
19956′	2″	—No. 1 C&B
1196′	2″	—No. 2 Com.
	BLACK WALNUT	
2873′	1″	—No. 1 C&B
1151′	1″	—No. 2 Com.
	WILLOW	
1446′	1″	—No. 1 C&B
	CHERRY	
4747′	1″	—No. 1 C&B
2187′	1″	—No. 2 Com.
	ROCK ELM	
12498′	2″	—No. 1 C&B
	SOFT MAPLE	
14397′	2½″	—No. 1 C&B
	BASSWOOD	
1549′	1″	—No. 1 C&B
606′	2″	—No. 1 C&B
	BUTTERNUT	
2584′	1″	—No. 1 C&B
	HARD MAPLE	
31788′	1″	—No. 1 C&B
243927′	1¼″	—No. 1 C&B
227707′	1½″	—No. 1 C&B
1796′	1½″	—No. 2 Com.
217401′	2″	—No. 1 C&B
11410′	2″	—No. 2 Com.
38016′	2½″	—No. 1 C&B
11091′	3″	—No. 1 C&B
2796′	4″	—No. 1 C&B
	BEECH	
3000′	1½″	—No. 2 Com
500′	2″	—Log run
250′	2½″	--Log run
350′	3″	—Log Run
100′	4″	—Log run
	BIRCH	
15998′	1″	—No. 1 C&B
22311′	1¼″	—No. 1 C&B
11748′	1½″	—No. 1 C&B
50157′	2″	—No. 1 C&B
87172′	2½″	—No. 1 C&B
7866′	3″	—No. 1 C&B
	PLAIN OAK	
9869′	1″	—No. 1 C&B
1107′	2″	—No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

Barclay is Back!

If there is anything in Cedar, Chestnut, Gum, Oak, Poplar, or Walnut you are wanting, see him before buying. If he has already called on you, or not yet shown up, a line to J. H. Barclay, Queens Hotel, Toronto, will catch him.

We want to move quickly:

4/4 and 8/4 No. 1 Com. Quartered Red Gum
4/4 No. 1 Common Quartered White Oak
4/4 No. 2A Common Poplar
4/4 No. 1 Common Poplar
6/4 No. 1 Common Walnut
8/4 No. 1 Common Walnut

Satisfactory Service

R. R. May Hardwood Co.

1522 S. Sixth St Louisville, K.Y.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Ply Wood Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

High Grade Southern Hardwoods

GUM

POPLAR

OAK

Have you ever used lumber from our mills? If not, may we suggest that you let this serve as a reminder to drop us a trial order? You are anxious to produce the finest furniture — these high grade hardwoods will help you.

Every shipment graded in a way that will please you.

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY Memphis - Tennessee SERVICE

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

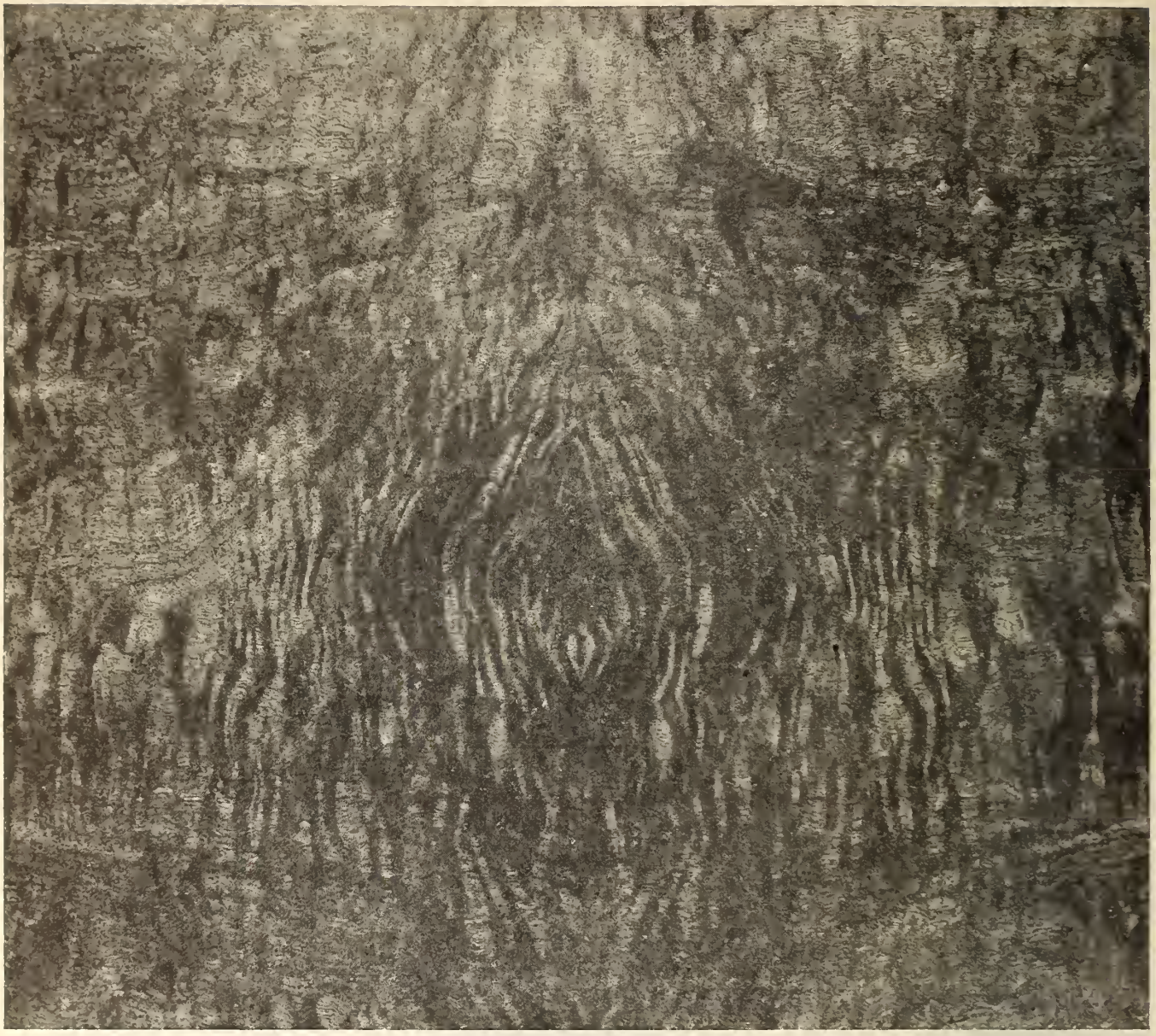
Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO



It Stands Out Above the Average

The general consensus of opinion is that Iowa-grown Walnut possesses a shade better grain and marking on the average than other Walnuts.

Selected Iowa-grown logs, cut with extreme care to preserve the inherent beauty make IOWA WALNUT. You owe it to yourself to investigate before you buy. Write or wire to-day for quotations.

IOWA WALNUT

Lumber and Veneers

—grown on Iowa corn land

DES MOINES SAWMILL CO., S. W. 10th and Murphy Streets, Des Moines, Iowa.

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

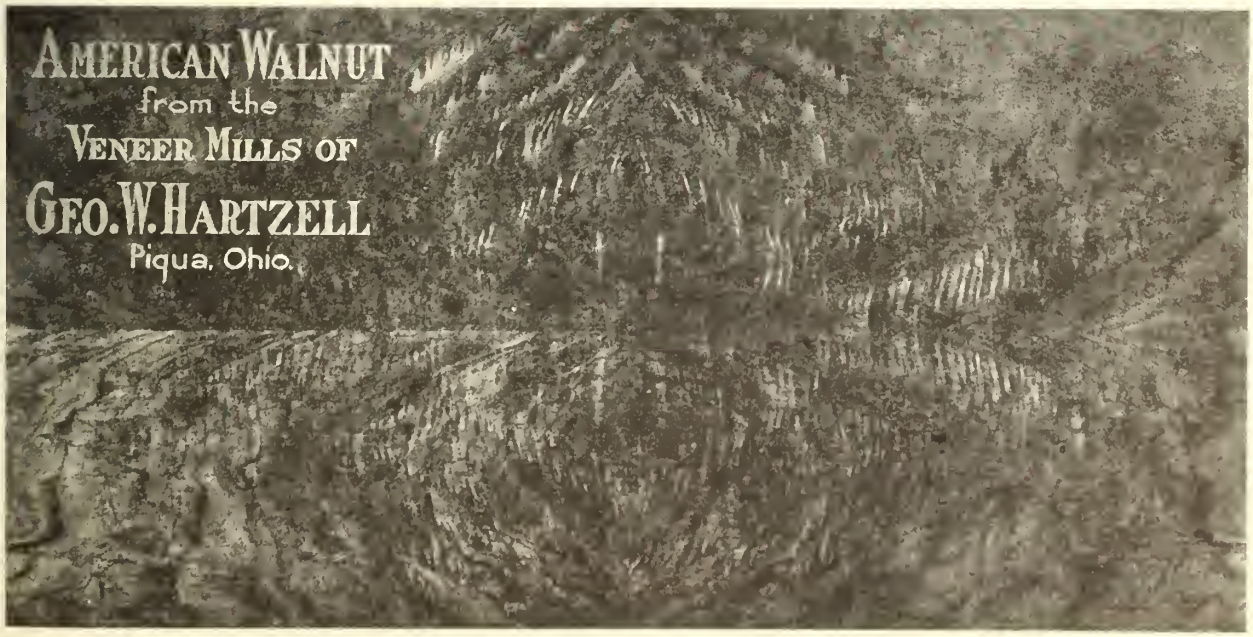
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manu facture.

Oak Timbers and Planking

The **Mowbray & Robinson Co.**
(INCORPORATED)
Manufacturers
Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative:
A. K. Johnson, Traders Bank Building, Toronto, Ont

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE
Kansas City - Kansas

ELM MAPLE

FOR SALE RUSH LUMBER COMPANY FOR SALE

GUM OAK

ASH POPLAR

	QTD. WHITE OAK		4-4	Sound Wormy	25,000′
4-4	F. A. S.	2,000′	4-4	No. 3 Com.	70,000′
4-4	F. A. S. 10″ & up	1,000′	5-4	F. A. S.	2,000′
4-4	No. 1 Com.	15,000′	5-4	No. 2 Com.	13,000′
4-4	No. 2 Com.	15,000′	6-4	No. 1 Com.	2,000′
5-4	F. A. S.	14,000′		PLAIN RED OAK	
5-4	No. 1 Com.	8,000′	3-4	No. 1 & 2 Com.	70,000′
5-4	No. 2 Com.	4,000′	4-4	F. A. S.	2,000′
6-4	No. 1 Com.	30,000′	4-4	No. 1 Com.	10,000′
6-4	No. 2 Com.	20,000′	4-4	No. 2 Com.	20,000′
8-4	F. A. S.	5,000′	5-4	F. A. S.	7,000′
8-4	No. 1 Com.	3,000′	5-4	No. 1 Com.	15,000′
	PLAIN WHITE OAK		5-4	No. 2 Com.	3,000′
4-4	No. 1 Com.	5,000′		QTD. RED GUM	
4-4	No. 2 Com	8,000′	4-4	F. A. S.	7,000′

4-4	No. 1 Com.	13,000′		POPLAR	
5-4	F. A. S.	2,000′	4-4	No. 2 A Com.	25,000′
6-4	F. A. S.	3,000′	4-4	No. 2 B Com.	35,000′
6-4	No. 1 Com.	14,000′	5-4	Sel. & Bet.	9,000′
	RED GUM S. N. D.		5-4	Saps	3,000′
8-4	No. 1 C&B.	70,000′	5-4	No. 1 Com.	12,000′
10-4	No. 1 C&B.	40,000′	5-4	No. 2 A Com.	8,000′
	SAP GUM		6-4	Sel. & Bet.	7,000′
5-8	No. 2 Com.	7,000′	6-4	No. 2 Com.	12,000′
5-4	F. A. S.	1,000′	8-4	Sel.	3,500′
5-4	F.A.S. 13″ & Up	4,000′	8-4	Sap	8,000′
5-4	No. 1 Com.	9,000′	8-4	No. 1 Com.	3,000′
6-4	F. A. S.	11,000′		MISCELLANEOUS	
6-4	No. 1 Com.	6,000′	4-4	L. R. Qtd. B. Gum	25,000′
6-4	No. 2 Com.	4,000′	4-4	L. R. Pln. B. Gum	25,000′

MEMPHIS, TENN.

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

Sawed Veneer

Quartered White Oak

For Furniture and Panels

Plain Red Oak

For Interior Trim and Doors

Cypress

For Battery Separators

Manufacturing Uniformly Good. Quality Unsurpassed

James E. Stark & Co., Inc.

MEMPHIS, TENN.

McDonagh Lumber Co.

203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods

Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

Calhoun Plywood Company

Panels Tops Counter Fronts

OPERA CHAIRS
in the White or finished.

Vegetable or Waterproof Glue.

Sheboygan - Wisconsin

WAYNE LUMBER CO.

Manufacturers and Wholesalers

American and Canadian
Hardwoods

Birch and Maple—Our Specialty

Special items we want to move:
BIRCH 50,000′ 1″ No. 1 C & B
60,000′ 2½″ No. 1 C & B
40,000′ 3″ No. 1 C & B
MAPLE 2 carloads 2″ No. 1 C & No. 2 C
1 carload 1¼″ No. 2 Com.
SOFT ELM 70,000′ 1″ log run
70,000′ 2″ log run
BASSWOOD 1 carload 2″ log run

110 West 40th St. New York

BEDNA YOUNG Lumber Company

Jackson - Tennessee

Manufacturer of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for
High Grade Lumber
please let us have your enquiries.

HARDWOOD LUMBER

'A Quality you will admire"

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Kiln Dried Products

Our kiln at Owensboro is a thoroughly modern equipment for handling green or dry lumber with efficiency and entire satisfaction.

Our facilities enable us to give real service—straight or mixed carloads.

Try our soft textured and finely figured quartered-sawn red and white oak. It will please you.

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills Owensboro; Campbellsville, Kentucky

DIMENSION

My Specialty is
Dimension Lumber
For Manufacturers of
Wagons and Implements, Buggies and Autos, Furniture, Railroad Car and Track Material

Standard Sizes on Hand for Prompt Shipment. Special Sizes Cut to Order

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office Dimension Mill & Yard
Belt Line at McLean.
MEMPHIS - TENN.

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated

General Office, NEW ORLEANS, U.S.A

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn
Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

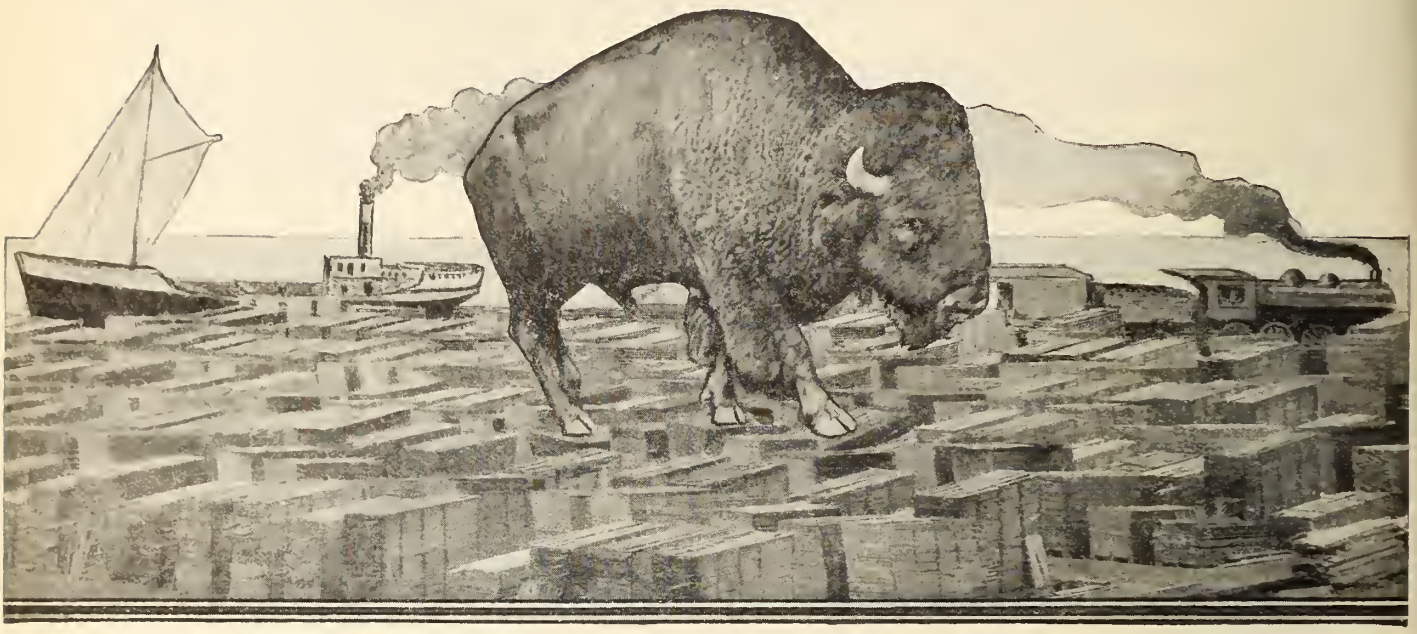
A few Specials :

130,000 ft. 4/4" No. 1 and No. 2 Common Qtrd. White Oak
65,000 ft. 4/4" No. 1 and No. 2 Common Plain White Oak
100,000 ft. 4/4" No. 1 and No. 2 Common Poplar

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Buffalo for Hardwoods



"LET BUFFALO DO IT"

Buy and Sell Your Hardwoods in Buffalo

Do you want prompt shipment? We can give you service. Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.

Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

Frank T. Sullivan
Specialities:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
Northern Grey Elm
and
Brown Ash
Niagara Street Cornor Arthur

ATLANTIC LUMBER COMPANY
HARDWOODS
West Virginia Soft Red and White Oak
Our Speciality: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller, Sturm & Miller
1142 Seneca Street
Hardwoods of All Kinds

YEAGER LUMBER CO., Inc.
SPECIALITIES
Oak, Poplar, Ash, Maple
932 Elk Street.

STANDARD HARDWOOD LUMBER COMPANY
HARDWOODS
Prompt Shipment { From Buffalo Yards or from mill direct to you
8 Million Feet Dry Stock on hand
1333 Clinton St.

G. Elias & BRO., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and fir timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B WALL Pres. T. H. WALL Vice-Pr.
M. M. WALL, Treasurer
940 SENECA ST.
We Specialize in White Ash, Oak, Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

HUGH McLEAN LUMBER CO.
Hardwoods of all Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

TAYLOR & CRATE
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

Specialty E C & S *Birch*

Canadian Birch allows full Expression of the Furniture Craftman's Art

It would be difficult indeed to imagine a more beautiful Chesterfield chair than the one shown above, bearing the stamp of one of our large American clients.

It is only logical that such beauty of design and skill of workmanship should command the finest materials—in this case Canadian Birch supplied by Edward Clark & Sons Limited.

As a matter of fact this same wood finds its way into much of the fine furniture manufactured both in Canada and "across the line."

A close, even texture, beautiful grain and economical cost undoubtedly account for its popularity.

We shall be only too pleased to send you prices and further details. Why not let us ship you a trial car?

Edward Clark & Sons Limited

807 Bank of Hamilton Building **Toronto, Canada**

EFFICIENCY *COURTESY* *SERVICE*

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES—that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

AMERICAN BLACK WALNUT

LUMBER **VENEERS**

OUR SPECIALTY

We are prepared to furnish straight or mixed cars, all grades 3/8" to 4" in thickness.

BAND MILL IN DAILY OPERATION

....Various items in Quartered White and Red Oak and Cherry.

1/28". SLICED. WALNUT VENEER especially selected for quality wood and color.

The Kosse, Shoe and Schleyer Co.

Lock Box No. 18 St. Bernard, Cincinnati, Ohio.

Agents in all Furniture Centres.
Offices: Baltimore, Md., Jamestown, N.Y. and Grand Rapids, Mich.
Represented in Chicago, Rockford, Ill., Detroit, Kitchener, Ont., Canada, New York City and San Francisco.

WOOD TURNINGS

Let us quote you on your requirements for handles and small wood turnings

J.H. Connor & Son
Limited
Ottawa Ont.

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co.
Orillia, Ontario
Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.—	85,000
1¼ in.—	3,500
1½ in.—	

CHERRY

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
1 in.	44,500	.....	203,900	18,500
1¼ in	4,900	.....	37,600	7,500
1½ in.	2,000	.....	34,700	36,300
2 in.	6,000	.....	22,200	61,900
2½ in.	5,500	.....	4,300	2,200
3 in.	25,700	.....	6,500	3,300
4 in.	4,000	.....	900	400

CHESTNUT

	1 & 2	Clear Strips.	No. 1 Com.	S.W. & No. 2 Com.
¾ in.	500	.....	56,000	91,000
1 in.	11,000	500	45,000	1,000
1¼ in.	66,800	300	100,200	159,200
1½ in.	34,500	.....	40,000	.....
2 in.	2,200	.....	15,300	89,200
2½ in.	4,000	.....	1,500	.....
3 in.	1,100	.....	1,000	500
4 in.	1,500	.....	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
½ in.	6,500	.....	.....	.....
¾ in.	900	300	23,600	9,000
⅝ in.	2,800	.....	5,500	800
1 in.	17,300	10,000	52,400	27,000
1¼ in.	5,000	.....	6,000	.....
1½ in.	600	.....	2,400	.....
2 in.	.....	.....	25,100	5,700
2½ in.	2,000	.....	400	.....
3 in.	2,000	.....	1,300	.....
4 in.	2,500	.....	1,700	.....

PLAIN WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	1,000	.....	.....	.....
½ in.	100	.....	.....	.....
⅝ in.	2,150	.....	8,000	16,900
¾ in.	274,800	.....	453,800	122,000
1 in.	42,300	1,700	78,000	85,200
1¼ in.	6,300	.....	15,100	.....
1½ in.	51,300	.....	84,000	12,000
2 in.	29,000	.....	125,000	54,000
2½ in.	152,800	.....	69,500	3,000
3 in.	55,800	.....	75,800	14,400
3½ in.	4,500	.....	4,000	1,500
4 in.	65,000	.....	38,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	24,200	.....	.....	.....
¾ in.	170,000	.....	327,000	65,800
⅝ in.	2,400	.....	77,000	42,600
1 in.	30,200	3,150	56,000	125,400
1¼ in.	11,700	2,400	16,600	.....
1½ in.	138,900	4,300	46,200	32,000
2 in.	91,500	.....	162,000	71,000
2½ in.	70,100	.....	26,000	3,700
3 in.	23,800	.....	20,500	7,000
4 in.	16,600	.....	10,900	.....

QUARTERED RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
¾ in.	1,700	.....	9,700	500
1 in.	10,200	5,400	7,500	1,400
1¼ in.	2,000	.....	.....	.....
1½ in.	.....	.....	.....	.....
2 in.	.....	.....	7,400	.....

SAP GUM

	1 & 2	Strips.	No. 1 Com.	No. 2 Com.
1 in.	.....	16,000	21,000	.....
1¼ in.	.....	.....	.....	.....
1½ in.	.....	2,400	6,000	13,500
2 in.	.....	.....	5,700	10,400
2½ in.	.....	.....	.....	.....

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	20,000	9,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

	No. 1	No. 2
1 in.	16,300	10,900	9,500
1¼ in.	6'000	8,325	.....
1½ in.	12,000	13,300	9,500
2 in.	9,000	3,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	2,000	6,000	7,000
5/4	9,400	10,800	.....
6/4	8,900	5,500	4,600
8/4	1,300	19,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No.2 Com.
⅝ in.	18,000	15,800	31,300	800
1 in.	27,000	5,200	91,900	.....
1¼ in.	22,300	360	5,700	6,000
1½ in.	19,100	13,000	29,000	7,500
2 in.	15,000	.....	10,500	24,500
2½ in.	10,800	6,000	.....	.....
3 in.	17,900	.....	11,400	47,000
4 in.	6,500	.....	300	450

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto
MANUFACTURERS SOUTHERN HARDWOOD LUMBER
Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft.....8/4 No. 1 Com

Band-mills at Baton Rouge, La. Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

Mills: Coal Grove, Ohio

General Offices: 33 Rector St. New York City

Ash Poplar Cypress

HAFNER

MANUFACTURING COMPANY

1 Car 4/4 FAS. Pl. Red Gum.
1 " 5/4 " " " "
1 " 6/4 " " " "
½ " 8/4 " " " "
3 " 4/4 No. 1 C&S. " "
1 " 6/4 " " " "
2 " 8/4 " " " "
2 " 4/4 No. 2 Com. " "
1 " 4/4 No. 1 C&B. Figured Red Gum.

1 Car 4/4 FAS Qtd. Red Gum.
2 " 5/4 " " " "
1 " 6/4 " " " "
1 " 4/4 No. 1 C&S. " "
2 " 5/4 " " " "
½ " 6/4 " " " "
2 " 1 x 13-17 Sap Gum Box Bds.
1 " 4/4 FAS Sap Gum.
1 " 8/4 No. 1 C&S. Sap Gum.

1 Car 4/4 FAS Pl. Red Oak.
½ " 5/4 " " " "
1 " 6/4 " " " "
1 " 8/4 " " " "
4 " 4/4 No. 1 C&S. " "
3 " 5/4 " " " "
1 " 8/4 " " " "
2 " 4/4 No. 1 C&B. Sound Wormy.
1 " 5/4 No. 1 C&B. Sound Wormy.

Thoroughly dry ready for immediate shipment in mixed cars if you desire

ST. LOUIS, MO., U.S.A.

E S T A B L I S H E D 1 8 7 1

Oak Red Gum

Lumber Specials

The following items of Southern Hardwoods are on hand at our Little Rock mill for prompt shipment. This is our own manufacture, band sawn stock, dry, good widths and excellent lengths, graded strictly according to National Hardwood Lumber Association rules.

QUARTERED RED GUM

1	Car	4/4"	FAS
3	"	5/4"	"
3	"	6/4"	"
3	"	8/4"	"
1	"	12/4"	"
2	"	4/4"	No. 1 Com
3	"	5/4"	" "
6	"	6/4"	" "
1	"	8/4"	" "
½	"	10/4"	" "
1	"	12/4"	" "

QUARTERED SAP GUM

4	Cars	5/4"	FAS
19	"	8/4"	"

QUARTERED FIGURED RED GUM

10	M	4/4"	FAS
2	Cars	4/4"	No. 1 Com.

PLAIN FIGURED RED GUM

3	M	5/4"	FAS

PLAIN RED GUM

½	Car	6/4"	No. 1 Com.
1	"	8/4"	" "

QUARTERED WHITE OAK

1	Car	5/4"	FAS
¼	"	8/4"	No. 1 Com.

Any of these items can be kiln-dried promptly. Our kiln-drying represents the latest improvements and methods in efficient and scientific dry-kiln operation.

E. L. BRUCE COMPANY
MANUFACTURERS
MEMPHIS, TENN.

Band Mill: Little Rock
Oak Flooring Plants: Memphis; Little Rock

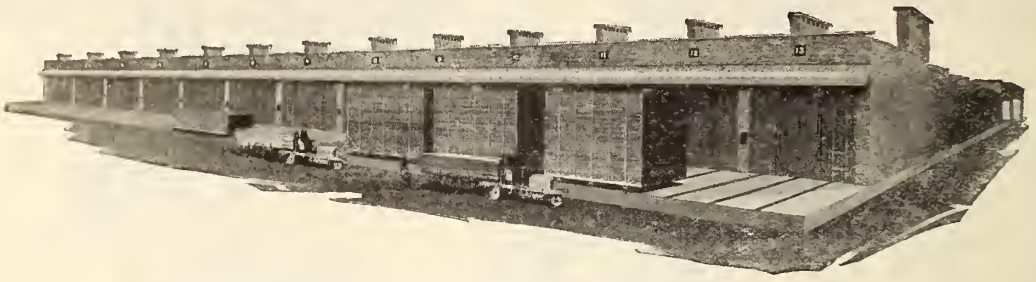
Walnut
Oak
Poplar
Chestnut
Gum
Ash

Will Ship High Class Stock and Make Prompt Shipment.

Leland G. Banning
Cincinnati, Ohio

Canadian Representative:
A. E. Klippert, 11 Laxton Ave
Toronto

KILN DRIED HARDWOODS



Kiln capacity 3,000,000 ft. monthly

WEST VIRGINIA
OAK
CHESTNUT
WHITEWOOD
BIRCH
HICKORY

We earnestly solicit your inquiries

AROMATIC RED CEDAR

ARKANSAS
RED GUM
SAP GUM
OAK
ASH
ELM

The M. B. Farrin Lumber Co.

CINCINNATI, OHIO

Dependable Shippers of American Hardwoods

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars

All Canadian and American Hardwoods
Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO

Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.

Subscription, Canada, Great Britain and British Possessions $2.00; United States $2.50; other Foreign Countries $2.00. Single Copies 15 Cents.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 Toronto, July, 1922 No. 7

Avoiding Credit Losses

The owner and manager of one of our largest woodworking establishments recently remarked that he was not opening any new accounts until the speculative element in the present building activity—this means in most cases the newer builders in the field—had had sufficient time to make good or go under. To put it another way he intends to play safe instead of carrying the load and taking the chances of those who have little or nothing to lose but who stand to make a good profit if they can turn their building at fair figures. His attitude is not only logical but shows sound business judgment. Later on when conditions in the building field have become a little more stabilized will be time enough to consider extending credit to new accountants.

Woodworkers have never given the attention to credits that the subject should receive and a result of granting unwise credits, of taking unnecessary chances and of not being able to collect what is justly due them, many are out of business who should have succeeded but for this oversight, whilst others are struggling along hampered by lack of capital and shortage of available funds when they should be on easy street. This is so generally known that it is a wonder we do not profit from our observations and experience.

Credit, it is said, is the foundation of our whole business structure; it is also the quicksand of our business graveyard, if handled unwisely. Why should a builder expect a woodworker to supply him with lumber and building material and then wait for his money until the building has been completed and sold? About the most logical reason which can be advanced is that it has been done, is being done and doubtless will be done.

That the building industry is looked upon in a different light is evidenced by the lien laws drafted to protect those who cater to the demands of this field. Regardless of the protection which may or may not be afforded by our machanics' and other lien laws it is questionable if there is any valid reason why credit terms should differ in this field. In other lines, even where the turnover is extremely large, short credit terms, thirty days, are allowed on approved accounts and those who cannot command a good rating are compelled to pay cash or go without. It would be a good thing, a step in the right direction, if some concerted action tending towards shorter, stricter, uniform credit terms were taken by those woodworkers who deal largely with the building industry.

Nor should this stop there, as those in other branches of the industry are not immune from credit losses. It is particularly unfortunate that in an effort to secure orders and keep things moving many woodworkers sacrifice profits and then take a chance on getting any of their money. In other words they gamble with credit as well as with money in their struggle for business. When it is not certain that the money will be forthcoming, when it is felt that a chance is being taken, it is then time to either call a halt, demand security or make a thorough investigation into the standing of the customer with a view to ascertaining exactly what the risk is.

The furniture industry is in the most favorable position, with regard to granting credits, of any branch of the woodworking field. Through their association they have developed a credit Bureau which has been raised to a high degree of efficiency. The result is that those who consult this bureau and follow its ratings are doing business with a minimum of loss. This is evidence to the fact that several of the larger furniture manufacturers, those doing a large volume of business, are not making any debts, while some others who think they know or who are willing to take a chance, are incurring losses running into thousands of dollars annually.

When some such source of information as the furniture manufacturers' credit bureau is not available it is well to ascertain all facts pertaining to credit customers, learn what their assets are, if they are clear or encumbered and best of all get a few references among those with whom they have been doing business and then investigate and see if they are slow or prompt to pay and if they are considered good risks. Profits are too uncertain in the woodworking field to give one much leeway to gamble with credits.

It seems to some men that it is impossible to set four counters on a block so that each will do its fair share of work. It can be done, but it requires careful adjustment of the cutters and a knowledge of how to sharpen them.

What About Reducing Your Costs?

Is Too Much Attention Being Given to Cost Recording to the Exclusion of Cost Reduction?—It is Essential Not Only that Costs be Known and Recorded but also that Every Attempt be Made to Keep Them Low—Functions of the Cost Accountant and Industrial Engineer Compared

By L. R. Wright*

Recent issues of the "Canadian Woodworker" have contained a wealth of good material dealing with cost accounting in the woodworking industry, outlining how cost data can be secured and recorded, and stressing the vital necessity for a greater interest in accurate costs. The need for wide spread cost knowledge is great. Undoubtedly vast sums of money are being lost in this industry each year, because of a lack of interest in cost work and cost records, or because there are many woodworkers who do not or will not realize the value of maintaining a cost system.

Without in any way detracting from the value of and necessity for cost work, a woodworking plant is not properly organized unless it has a cost system in operation. I would like to deal with another phase of management and organization, equally important or perhaps more important, the value of which is not so widely recognized, namely, industrial engineering. My intention is to compare these two phases of plant organization, show how both are vitally necessary for the highest degree of success, how each dovetails into the other and how one provides an ideal foundation for the other.

Industrial Engineering in Woodworking Plants

It was not so long ago, perhaps a little over a year, that the "Canadian Woodworker" and several other papers published an article dealing with engineering in the woodworking industry. This treatise outlined briefly some of the directions in which the specially trained industrial engineer could assist in improving methods, increasing production per man and per machine, eliminating waste or at least diverting it into more profitable channels, and reducing costs, all tending to raise the status of the woodworking industry and to place it on a plane commensurate with its greatness and age. At the time this article aroused a considerable amount of interest as there was a slight realization of the need for the services of specially trained engineers and a further realization of what could be accomplished if gone about in an intelligent and practical manner. Since then there has been a fuller realization of the need and value of the industrial engineer with a corresponding increase in the interest which is really being shown in this work and as a result industrial engineering has been and is being successfully carried out in many woodworking plants.

The Work of the Cost Accountant

To many, the cost accountant and the industrial engineer are closely allied. This may be due in part to the tendency of some few of the larger organizations who are primarily accountants to assume the functions of the industrial engineer and to attempt work in both fields. This should not be so, for the qualifications, experience and training which insure success in one field are not those which necessarily produce satisfactory results in the other field. This may be judged from a comparision of the functions of cost accountant and the industrial engineer. The former deals with costs as he finds them, taking his data from the operations regardless of the degree of efficiency or inefficiency with which they may be preformed, and upon such information he bases his records and conclusions. Undoubtedly this gives an accurate outline of costs as they exist and if such information is properly analysed it may point the way to some of the most glaring faults in the plants or methods. To carry it even further by comparing different costs covering the same work or the same operation in the same plant the fluctuations in costs may be detected. It will be seen, then, that cost accounting can give accurate costs and that the fluctuations in cost may be determined but is does not provide any standard basis upon which to compare or judge the efficiency with which each operation is performed or the relative efficiency of the plant as a unit and as a result does not provide a foundation upon which costs may be intelligently reduced.

What the Industrial Engineer Deals With

On the other hand, the industrial engineer does not deal with costs as they are, but as they should be. Experience and training have developed a foundation upon which the relative efficiency of man, machines and operations may be judged. If he is a specialist in one particular field—and it is in the best interest of all concerned that specialization should be encouraged—his work in that field should have and will have provided sufficient data upon which to determine deflnite standards of performance for men, machines and methods under varying conditions and for many different products and therefore place him in a position to accurately and intelligently judge the relative efficiency of each minute operation as well as of more important operations, whole departments and the plant itself. His work then will consist largely of reducing waste, both of material and labor; analyzing operations; studying methods and equipment; planning the work so that machines are operated at something approaching capacity; eliminating trouble of various kinds and in other ways striving to bring down costs to as near the standard or minimum as conditions will permit and thus provide a basis for establishing standard labor costs. When this has been accomplished the accountant still takes the costs as they exist—only by this time they are standard—and upon them builds his structure of cost data.

Have I made the difference clear? One concerns himself with recording and tabulating costs as they exist but is not concerned as to whether they are high or low, his goal being accuracy. The industrial engineer, on the other hand, is not very much concerned about recording; his attention centres rather on lowering costs in every way possible. The success of his efforts will be judged on the results as recorded by the accountant and it is clearly, therefore, in his in-

*Statistician, Forest Products Engineering Co., Chicago.

terest not to over systematize and increase the overhead by the use of a multitude of forms and red tape and the one who knows his work does not do so. If then the industrial engineer provides the ideal basis for the cost accountant that is as near minimum as conditions will permit, it is not unreasonable to suggest that the work of the industrial engineer comes before that of the cost department and that both are equally essential to the intelligent and efficient operation of a woodworking plant.

Watch Your Credit, Make Your Terms Short

And Do Not Give Anything More Away in Discounts than your Particular Locality Expects of You —Advice for the Small Mill Man—Production, Selling and Credit Tied Up Together

By O. W. Brightman*

Mr. J. A. Loetscher (in the June issue of the "Canadian Woodworker") discussed the wholesale side of the credit and discount question very thoroughly. In this discussion of his paper I shall attempt to open up the credit problems of the small mill man as effectually as I can.

It seems to me there are at least two things coming into this question that are so closely interlated that it is almost impossible to consider one without giving the other two consideration. This makes a three point consideration, production, selling and credit, and the manager who is able in a small mill to fill the three places is somewhat of a wonder to me. One man may be especially strong in the production end and still his business will be a failure without his being a salesman as well as a credit man. The selling end of any proposition requires a well trained mind, a man thoroughly versed in his product and a student of human nature but his work will come to naught if he is not able to have production behind his efforts and the credit established before hand.

The first question that must be considered when a customer comes to you for material is the one of "Can he pay for it?" I remarked to a salesman a few days ago that there were three good reasons why I did not place an order with him for lumber and stated that the first was that I did not have any money. He evidently had credits in his mind and came back quick to never mind the other reasons. The manager who must do his own selling, look after his own products and then be his own credit man must be exceedingly careful when he comes to the third role, that of determining the credit. On the other hand he must work so thoroughly and so carefully with the other sides of his character that the three will co-ordinate in making a smooth transaction that will be profitable to him and a pleasure to the customer.

Credit Problems in the Rural Districts

Those who are still dealing to some extent with the farmer have still another problem, especially this year, when the farm products are most thoroughly deflated and everything that the farmer has to buy is still more or less inflated by labor conditions. It is our experience that it is necessary to grant the farmer extra time for payment and we find him almost invariably willing to give us a note at the time his account comes due and by using this note in our bank it is possible to grant this extension of time. Our locality probably is more favorably in this respect than any other, especially where the farmer depends altogether on stock feeding and grain raising.

Those of us who are doing business in these localities are confronted with an entirely different problem of credits. It is my personal opinion that the man who does not make full use of the lien laws in granting credits is playing an extremely hazardous game at this time. It is bad enough to take the ordinary and unavoidable loss due to business mortality but I maintain that it is not necessary to take a loss where it is possible to protect yourself by a lien. It is, however, very unwise to sell an account where you know that it is going to be necessary to avail yourself of your lien rights but oftentimes it is necessary to meet unfavorable things in this way.

The frozen credit question is a serious one this year and it makes many of us curtail our business to meet this present day emergency. We can feel relieved, however, if we have enough surplus accumulated to be able to carry us through this period.

Terms and Discounts Applying to Small Man

On the question of terms, I have but little to say. Since engaging in the retail lumber and planing mill business I find that each locality settles the question of its own terms of payment and discounts. In a general way, we adhere strictly to a 60-day term on our accounts although as in the case of the farmer it is not always possible to do this, but we do try very hard to get accounts over sixty days due closed by note of as short a term as possible. By collecting these through the bank there are very few notes that are not paid at maturity.

On the question of discounts the small mill man confronts a peculiar situation in many localities. Throughout the Fox River Valley from Oshkosh to Green Bay the general contractors have asked and received from the material realer a 5% discount from all bills for the previous month provided they are paid on or before the 10th. of the month. I personally do not like this idea and in order to avoid class distinction we allow 5% to all our customers. We insist on all bills other than to the general contractor to be paid in 10 days from the date invoiced in order to secure the 5%. This has some advantages over the old 2% discount which we believe is quite universally used, inasmuch as it brings us money more promptly that we would otherwise get.

We have gone completely away from the old system of discount when a customer building a new home was allowed to finish his whole house and then come in and get the regular cash discount. The Green Bay Planing Mill Co. renders bills to its customers just as the material is delivered, whether it is to a contractor or owner.

It is my firm conviction that there never was a time when we should be as careful in making accounts or use more strenuous means to secure our accounts after they are once made than now.

We must have production undoubtedly to be able

*President, Green Bay Planing Mills, Green Bay, Wis., before the Millwork Cost Bureau.

to make the price. We must have the selling efforts necessary to produce the orders for production but above all scan your credits and make as few bad debts as you can and even at that you will find when you come to balance your books that you have some considerable amount to charge off.

We are all looking with longing eyes towards the time of so called normalcy. If I could have somebody define this word to me, I might discuss the matter with greater intelligence. I wonder who wants to go back to pre-war conditions as being normal, I for one would not be willing to make the attempt, and if today is normal then I am equally disappointed. These questions are so complicated that I only just want to bring them up before you and let each individual define for himself his own personal idea of what is normal condition. I don't care a whoop about what was the normal condition of 1912 and 1913. What we want is a 1922 stabilized situation that will give us confidence to proceed in an orderly manner.

Some people have suggested that we have precedents to follow which would indicate what is to come and that the world moves in cycles and they trace all sorts of imaginary lines across a sheet of paper to prove it but I have never been able to satisfy my mind that they know more about it than the rest of the world. They can tell us afterwards the signs that lead up to it and what you should have done. What we want righht now is someone to tell us how to do it but in the mean time watch your credit, make your terms as short as possible and don't give anything more away in discounts than your special locality expects you to.

Greater Attention to Drying Losses

Is Too Much Importance Attached to the Moisture Reducing Feature of Dry Kiln Operation at the Expense of Other Factors ?—Adequate Uniform Circulation is Probably the Most Important Element in Kiln Handling

A manufacturer of dry kilns recently made a suggestion to the effect that too much attention is being and has been given to the moisture content of kiln-dried lumber and not enough attention to the condition of the stock during the drying period and as a result the output of the kiln in many plants is not in as good condition as it should be. Whether or not there is any real foundation for this idea, it might be well to enlarge on this thought and attempt to define the goal at which both dry kiln owner and operator should aim, if they are sincere in their desire to secure the best possible results from their kiln equipment.

Undoubtedly, it is important that the stock be brought down to the desired degree of moisture content, for after all this is the sole aim of the drying and seasoning operation but in the effort to dry the lumber there are other important factors which must be given due consideration. Perhaps what prompted this suggestion was the fact that ever so often a kiln charge of lumber is ruined in an effort to dry it as quickly as possible and that the same desire for speed keeps the drying loss at a high figure, in most plants the assumption being that the attention of the operator was centered on hurrying the removal of the moisture to the exclusion of everything else.

What is Good Kiln Drying?

It might be well to start with a definition of good kilndrying. Good kiln drying might be defined as the drying of lumber by artificial means in the shortest time and with a minimum loss from spoiled lumber and degrade due to checking, warping, staining, honeycombing, etc., and so that the stock is free from strains, stresses and case-hardening. This may seem like a formidable program but if approached in a proper attitude it is not unsurmountable.

It is important that the lumber be reduced to the predetermined moisture content and it is just as important that full cognizance be taken of the other factors. Lumber that is dry but full of checks and honeycombs is worthless and regardless of whether the drying period is short or long, it is not good drying. The same may be applied, though perhaps not in the same degree, to lumber that has been case-hardened and which is full of internal strains.

Our knowledge of kiln-drying has advanced to the point where we know how, so that the solving of the drying problem resolves itself into a question of operating according to the present day theory and of obtaining equipment that will ensure the required conditions. When this is done the final result rests upon the attitude and knowledge of the kiln operator.

Of all the factors entering into the successful operation of a dry kiln, that is, exclusive of the human factor, which naturally takes first place, there is probably none quite so important as adequate, uniform circulation. If the rate of drying is too slow or if for any reason it is found advisable or disirable to shorten the drying by speeding up the drying operation, higher temperatures and lower humidities should only be considered as a last resort and then only under the most careful supervision. First, the circulation should be given attention. If it is not brisk enough or if it is sluggish and uneven in certain parts of the kiln, such faults should be corrected. It is surprising what can be accomplished in the way of improved results simply by correcting and, perhaps, increasing the circulation. This is true to such an extent that the claim is often made that with what might be called adequate, uniform circulation the output of a kiln can sometimes be doubled.

In conclusion, the rate at which the lumber is dried is all important but speed without quality is not very much good. Little, if anything, is gained, if by increasing the rate of drying the drying losses climb in proportion. The aim should be speed, but speed accompanied by minimum losses and having regard to the quality of the stock after it is dry. Perhaps there is not enough attention given to case-hardening. The tests for this trouble are simple and have been published in the "Canadian Woodworker and Furniture Manufacturer" on several occasions. If these are made at frequent intervals and resort made to steaming upon the slightest indication of case-hardening and in addition at the end of the run, it is not likely that there will be much trouble from case-hardening or internal strains of any kind.

There is not the slighest need to do a great deal of hard sand-papering on any class of work, as machines are now made to sand any shaped article.

Should Flooring Grades be Changed?

A Comparison of American and Canadian Grading Rules -- Canadian Manufacturers of Flooring Have Difficult Problem to Solve in Meeting U.S. Competition and at the Same time Maintaining a Quality Product

Manufacturers of hardwood flooring in Canada have a number of problems peculiar to their industry with which to contend. Chief among these are outside competition, high freight rates on raw material, variation in grades and uncertainty on the part of architects and contractors as to what the various grade terms represent. On top of this the question of Canadian competition is always an important factor.

It might be of interest to consider these various factors and see how they bear on the manufacturer in the marketing of hardwood flooring. Probably of first importance is the question of grades. The larger flooring producers in Canada have adopted standard grading rules which are more or less uniform. In applying these rules there is bound to be a slight difference in interpretation, depending to a certain extent on the standard of quality which has been established. Without departing very far from any set of grading rules, it is possible to grade close or grade wide or generously and produce two grades which, while coming under the same heading or trade term, vary considerably as to value. This undoubtedly occurs in the Canadian industry, and as will be pointed out later on, the price in this country is controlled by American competition. There may be a slight tendency for Canadian flooring manufacturers to stress the quality feature and to a certain extent compete on a quality instead of a price basis. It has been suggested that Canadian flooring men compete entirely on the quality of their product, each striving to outdo the other in the grading of his product. It takes considerable time to establish a grade or a reputation for flooring of a certain standard, and when the graders have been once trained to conform to this standard, it will be confusing, to say the least, if the standard were changed from time to time to meet competition.

A comparison of Canadian and American grading rules, as shown elsewhere in this article, affords an intensely interesting study. Through a difference in the definitions of the standard grades, chiefly with regard to minimum length and proportion of short material, and by establishing several extra grades, the American manufacturers are enabled to realize on the average slightly more for the run of their plants. Another feature that permits the American flooring producer to sell closer or to make larger profits, as the case may be, is the grade of the raw material which he uses.

Canadian Firms Use Higher Grade of Raw Material

There are two factors which influence the buying of raw lumber for flooring. One is the demand for the various grades of flooring. If none but the better qualities selected are being sought, it will be found necessary to purchase a higher grade of raw material so that a larger proportion of high-grade stock will result. If the call is for the medium grades, a lower quality of raw material will be found to be the most satisfactory. The other factor which determines the suitability of the raw material is the percentage of waste produced. It does not pay to handle any grade of material which gives a high percentage of waste, for the freight on the waste would practically offset any profit which might otherwise result.

In actual practice this means that the American hardwood flooring plants, particularly those situated at or near lumber—producing centres, manufacture their flooring from the lower grades of lumber, whereas the Canadian manufacturers must use better stock as they cannot afford to pay freight on any quantity of waste material. The result is that Canadian flooring manufacturers buy largely No. 1 common and better and sometimes a certain amount of F.A.S., while American flooring makers cut up No. 2 and 3 common with, perhaps, a small percentage of No. 1 common stock.

In a preceding paragraph it was intimated that the grade of material used had its effect on the quality of the grades produced. This applies particularly to lengths. It stands to reason that using the better grade lumber cannot help but mean a higher proportion of long stock which is a very desirable feature as far as the flooring buyer is concerned.

Prices Influenced by American Competition

The prices of Canadian flooring are practically governed by the American market. This holds true of thin flooring in particular. Ostensibly the Canadian producer is protected by a duty of 25%, but the difference in the freight on the finished product with all waste eliminated and the freight on the raw material in the rough is sufficient to wipe out this protection and enable American flooring men to compete in Canada on a basis of equality. While such phrases as "Buy Made-in-Canada Products" and "Patronize Home Industry" sound nice, they do not carry any weight, for a difference of $1.00 a M is often sufficient to swing the business in favor of outside concerns. This means that Canadian flooring manufacturers must watch the American market and govern themselves accordingly, and at the same time maintain the quality of their product. Canadian flooring users have been educated to high-grade material, and as a rule are not satisfied with any stock that does not come up to the mark.

Commenting on the question of grades, one large Ontario flooring manufacturer expressed himself as follows:—

"If the customer considered the quality and beauty of the floor after it was laid, he could readily be persuaded to use Canadian stock and would get better value for his money. It is a question if it would be wise for Canadian flooring manufacturers to alter their grades so as to compare with the American standard, but I am inclined to think that it would be a mistake to do so as it is generally conceded among flooring manufacturers that in meeting American competition, it is better business to have our grades higher than

Comparison of Canadian and American Rules

The Canadian rules have been adopted by the Canadian Flooring Manufacturers while the American rules are those accepted by the Oak Flooring and Maple Flooring Manufacturers' Assn.

Canadian Grading Rules

Quartered Oak

"Clear" shall have one face practically free of defects, excepting ⅜ of an inch of bright sap. The question of color shall not be considered. Lengths in this grade to be 2 to 16 feet, not over 15 per cent. under 3½ feet.

"No. 1 Grade" shall admit of small, sound knots and sap. Makes a good floor when care is taken in laying and finishing. Lengths, 1½ feet to 16 feet, and not more than 25 per cent. under 3½ feet.

Plain Oak

"Clear" shall have one face practically free of defects, excepting ⅜ of an inch of bright sap. The question of color shall not be considered. Lengths in this grade to be 2 to 16 feet, not over 15 per cent. under 3½ feet.

"No. 1 Grade" shall admit of small, sound knots and sap. Makes a good floor when care is taken in laying and finishing. Lengths, 1½ feet to 16 feet, and not more than 25 per cent. under 3½ feet.

Maple, Beech and Birch

"Selected Red or White" shall have one face clear of all defects, and selected for uniform color. Length 2 to 16 feet, not over 15 per cent. under 3½ feet.

"Clear" shall have one face practically clear, but color no defect. Green or dark streaks not over ¼ inch wide and 3 inches long, or its equivalent, and small defects which can be readily removed by the ordinary method of scraping after the Flooring has been laid, permitted. Tongue will permit of one-half short for 25 per cent. of length. This grade must have one face free from all shake and checks. Lengths 2 to 16 ft. but not over 15 per cent. under 3½ feet.

"No. 1 Grade" shall have largely one clear face, admitting occasional small, sound knots, and other slight imperfections. Also small checks not over 2½ inches long, providing they run parallel with edge, allowed. Color no defect. Lengths, 1½ feet to 16 feet, not over 30 per cent. under 3½ feet.

"Factory Grade" shall admit of knots and other imperfections. Will make a serviceable floor with some cutting. Lengths, 1 foot and up, not more than 50 per cent. under 3½ feet.

American Grading Rules

Quartered Oak

"Clear" shall have one face practically free of defects, except ⅜ of an inch of bright sap; the question of color shall not be considered; lengths in this grade to be 2 feet and up, not to exceed 15 per cent. under 4 feet.

"Sap Clear" shall have one face practically free of defects, but will admit unlimited bright sap. The question of color shall not be considered. Lengths in this grade to be 1 foot and up.

"Select" may contain bright sap, and will admit pin-worm holes, slight imperfections in dressing, or a small tight knot, not to exceed 1 to every 3 feet in length; lengths to be 1 foot and up.

Plain Oak

"Clear" shall have one face practically free of defects, except ⅜ of an inch of bright sap; the question of color shall not be considered; lengths in this grade to be 2 feet and up, not to exceed 15 per cent. under 4 feet.

"Select" may contain bright sap, and will admit pin-worm holes, slight imperfections in dressing or a small tight knot, not to exceed 1 to every 3 feet in length; lengths to be 1 foot and up.

"No. 1 Common" shall be of such nature as will make and lay a sound floor without cutting. Lenghts 1 foot and up.

Birch, Beech and Maple

"White Clear" is special stock manufactured from white clear maple lumber from the outside of the log, winter-sawed and end-piled in sheds to prevent staining, is almost ivory white, and is the finest grade of maple flooring it is possible to produce.

"Red Clear" beech and "Red Clear" birch are manufactured from all-red face stock, especially selected for color and are free from all defects. The color is a rich warm tint peculiar to no other wood.

"Clear"—13/16-inch and thicker, shall have one face practically free of all defects, but the question of color shall not be considered. Standard lengths in all widths in this grade shall be trimmed 2 to 16 feet; the proposition of lengths 2 to 3½ feet inclusive shall be what the stock will produce up to 20 per cent.

"No. 1"—13/16-inch and thicker, will admit of tight, sound knots and slight imperfections in dressing, but must lay without waste. Standard lengths in all widths in this grade shall be trimmed 1½ to 16 feet; the proposition of lengths 1½ to 3½ feet inclusive shall be what the stock will produce up to 40 per cent.

"Factory"—13/16-inch and thicker, must be of such character as will lay and give a good serviceable floor, with some cutting. Standard lengths in all widths in this grade shall be trimmed 1 to 16 feet; the proportion of lengths 1 to 3½ feet inclusive shall be what the stock will produce up to 60 per cent.

theirs and to educate the purchasing public in this respect so that they will demand our grades rather than American stock. I do not think it would be advisable to make any change in Canadian standards as the grades now prevailing provide stock that makes the best possible use of the lumber that is available for the manufacturer of hardwood flooring."

Terms Not Understood

A considerable amount of confusion exists among architects, contractors and flooring users as to the definition and quality of the various grades. These men do not seem to be conversant with the different grades put up, and as a result often specify one grade when they really mean another. Thus specifications for a job often call for "selected clears," "No. 1 clear," "No. 1 selects" or even "No. 1 flooring," and, no doubt, in each case the best grade is expected. This misunderstanding could readily be cleared up through a little educational publicity work in the proper significance of grading definitions.

The air suction in a chip and dust removing installation is determined by the fan and the number of openings connected to the inlet side.

When the finishing process of any class of work is very excessive, it means that the sawing and the planing has been done very badly, and the sanding machines are not being worked to their fullest capacity.

Band Resaws Will Prove Money Savers

Essential Machines in the Furniture Factory as They Reduce the Raw Material Inexpensively and Efficiently to Correct Workable Sizes With the Minimum Loss in Stock.

By Eugene T. Thompson*

The small band resaw is one of the most essential machines in a furniture or woodworking factory. No other conclusion is possible after an investigation into the use of the band resaw in connection with the manufacture of furniture.

The first reason for the band resaw is, of course, its ability to re-manufacture rough stock into any dimensions required. The average thickness of lumber purchased by furniture manufacturers is 1", 1½" and 2". In order to make up stock of 3/8" or thereabouts, as is required in practically all lines, without a resaw would mean sizing an inch board down to 3/8" which would of course be a criminal waste of good material and labor. With the resaw, however, one inch stock can be split, making two 3/8" pieces when finally dressed. If 1½" stock is used, three 3/8" can be made by means of the resaw.

It is admittedly impossible for the manufacturer to buy lumber in thickness that will dress down without waste, to the sizes he uses. The resaw, therefore, offers the cheapest and most efficient method for arriving at the desired results as practically no lumber is wasted. Another consideration is that a manufacturer can buy lumber of varying thickness at a price below the market for standard dimensions and then resaw this into sizes to suit his particular requirements.

Resaw Saves Other Operations

The resaw, however, has a use beyond that of cutting the raw material into workable dimensions as the following will indicate: In one factory, drawer sides which average 3/8" thick are made up of 1" stock. They are sent through the molder, which cuts a groove on both sides, rounds the outer edge and dresses both sides. Then it is sent to the resaw and split in the centre and the two pieces after being dressed on the reverse side are completed.

The advantage of this method is at once evident. Until the stock is finally resawed, two pieces are put through the molder and other operations at the cost of one. Instead of the resawing operation being first, it comes at the end of the manufacturing process. This same method is adaptable in many ways, effecting substantial savings in labor costs.

In the majority of plants, the rough lumber is first cut off according to lengths and to remove knots and other bad spots, then ripped so as to get only good clear lumber. It is then glued into blocks averaging 24" x 36" and from the glue rooms, really starts on its progress towards finished material.

Where Money is Saved

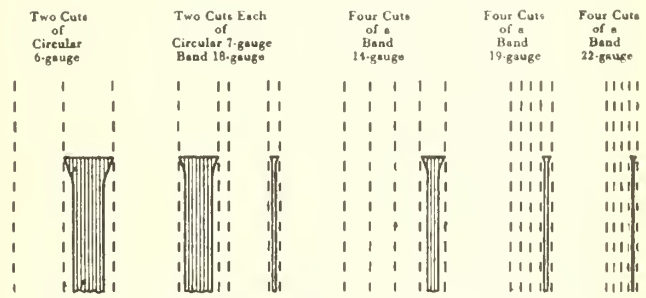
The resaw is called upon to handle a good deal of this stock from the glue room, as it will automatically centre saw, splitting each piece exactly in the middle or it will gauge saw, making three or more pieces of the same thickness, as required. Thus the rough material is reduced to a condition, where only the minimum amount of stock is removed in the surfacing operation and it is here where the money is saved and the resaw comes into its own.

In talking with a superintendent of a large factory, with a record of twenty-eight years behind him, the remark was made: "Could you get along without your resaw?"

"Get along without it?" he repeated the question. "I should say not! There isn't a more essential machine in my factory. If there is such a strange animal as a furniture factory without a resaw, I'll show you an outfit losing money faster in their production than the stockholders can shovel it in through the front door."

The above sums up the resaw situation in the furniture factory. It is an absolutely essential machine as it reduces the raw material inexpensively and efficiently to the correct workable sizes with a minimum loss in stock. Without a medium of this kind, the waste in raw material would be tremendous.

This applies, of course, to the band resaws. The circular resaw, a few of which are still in use, will cut up stock to the desired thickness but the loss in the saw kerf of a circular saw compared to that of a band saw, is so great that the circular saw's operating cost is much higher. Furthermore, the circular resaw requires considerably more power than the band resaw.


Two Cuts of Circular 6-gauge
Two Cuts Each of Circular 7-gauge Band 18-gauge
Four Cuts of a Band 14-gauge
Four Cuts of a Band 19-gauge
Four Cuts of a Band 22-gauge

A comparison of the cuts of various types of saws, indicating the advantage of band sawing over circular sawing

Band Resaws Remove less Kerf than Circular Resaws

The band resaw removes about 66% less kerf than the circular resaw, which would otherwise be a direct loss and one that will show up in gigantic proportions on the operation sheets at the end of the year. The difference in saw kerf is illustrated by the attached diagram.

It is seldom in a furniture factory that you find a resaw with wheels larger than 54 in. equipped to carry a six or seven inch saw, 18 to 22 gauge in thickness and about 26 feet in length. Such a machine with a roll opening of 14 or 16 in. and a depth of cut of 30 in. will handle any stock required in furniture work.

The majority of factory resaws have wheels from 44 to 48" in diameter, carrying 18 to 22 gauge saws, about 23 feet in length. The standard machine of these sizes usually has a roll opening of 12 1/2" with

*Of the McDonough Manufacturing Co., Eau Claire, Wis.

6 1/4" on each side of the saw, with a depth of cut of 24 or 25", which is ample capacity. Resaws of these sizes require from 20 to 40 horse power, depending, of course, on the kind of stock, its width, thickness and the rate of feed.

Resaws are inexpensive machines to operate and keep up. Frequently, these machines run for ten years without the necessity of replacing even a gear. They are easy to keep in alignment and with proper attention to oiling and to being kept free from sawdust will equal in length of service any machine in a woodworking plant.

Importance of Properly Conditioned Saws

Outside of proper oiling, cleanliness and alignment for wear of the machine itself, the most important consideration in the successful operation of a band resaw, is the condition of the saws. Many manufacturers of furniture try to economize in their rooms by not installing the necessary equipment to properly sharpen, wedge and tension the 4, 5" or 6" wide saw blades for the resaw. This is false economy as saws not properly put up will not operate efficiently and frequently spoil good lumber in miscuts, by running off, sawing thick and thin or leading out of the cut at the centre, which is entirely caused by poorly conditioned saws.

If your resaw is not doing good work, but appears to be mechanically correct, look into the condition of your saws, and satisfy yourself that the man who is doing your filing knows how to handle a wide band saw and has the equipment to do the work properly.

The finest resaw and the best saw in the world will make a sorry showing if the filer is not conversant with his duties.

The writer recently had an experience that will illustrate. A certain well-known make of resaw was not performing as it should and some rather harsh things were said about the machine. An investigation showed that the man who had charge of the saws, which were over 25 feet in length, had never done that class of work. When a saw got dull, he filed the teeth by hand, and put it back on the machine without a thought as to the tension or the set of the teeth. It was only natural that the saw did not run true and that they had trouble in making anything that even looked like good stock. A competent saw filer with some filing room equipment soon overcame all difficulty.

The majority of resaw troubles in a plant where only the wide and long band saws are used on such a machine can be laid to the improper handling of the saw. As the resaw is such an essential machine and can do so much towards reducing production costs in the saving of material, it is certainly deserving of the necessary equipment and help to keep it in first-class operating condition.

If you stone the saw down do it lightly, and be careful only to take off the metal above the stone marks .

A dirty glue pot will often spoil a fresh lot of glue. Cleanliness with glue means greater strength and fewer broken joints..

A small pipe connected with a fan is a big help to a fret cutting machine, as it directs the air which removes the dust from the lines on the wood.

Douglas Fir for Washer Tubs

The Pathologist of the Forest Products Laboratories of Canada Comments on an Article on the Above Topic Which Appeared in the June Issue

In connection with the article in the June issue of the "Canadian Woodworker," entitled "Douglas Fir for Washer Tubs," the following letter has been received from R. J. Blair, pathologist of the Forest Product Laboratories of Canada:

Montreal, July 3rd 1922

Editor, Canadian Woodworker:

My attention has been drawn to an article on "Douglas Fir for Washer Tubs" by W. McD. Tait, which appears on page 64 of the "Canadian Woodworker" for June 1922 where I am somewhat surprised to find myself quoted as an authority on the subject of washer tubs.

The following explanation will make clear my reasons for writing you in this connection. In May 1921 a letter was received at the Forest Products Laboratories of Canada from Mr. Tait asking for information as to the suitability of Douglas Fir for washer tubs, and in reply there was mailed to him a report on the subject [which appears below] If you will compare this report with Mr. Tait's article you will find that the two statements are hardly in accord with each other. I have never had the privilege of seeing one of Mr. Tait's washer tubs and you will find the statement in the report to him "Without examining one of the machines it is impossible to make a definite statement regarding the suitability of fir for its construction." When this sentence is omitted (as it is in Mr. Tait's article) the meaning is very materially changed. This report was not prepared for publication and if Mr. Tait chose to use it for an article he should have been more careful to use it in a way that would not create a wrong impression.

The article is also in error in stating that tests were carried out at the Forest Product Laboratories in Montreal. No such tests were made and the laboratories made no offer to perform such tests.

Forest Product Laboratories of Canada
Yours truly,
R. J. Blair
Pathologist

The report to which Mr. Blair refers and which was submitted by him to Mr. Tait is reprinted as follows:

Douglas Fir for Washer Tubs

When wood is used for such purposes as the manufacture of laundry tubs there are two independent relations regarding moisture which may be considered. These two conditions are the shrinkage and swelling of the wood due to its moisture content and decay of the wood which results from keeping it permanently moist.

Without examining one of the machines, it is impossible to make a definite statement regarding the suitability of fir for its construction. The special advantage over Douglas fir which Louisiana cypress is supposed to possess is its greater resistance to agencies causing decay. It is not thought, however, that this consideration should be of any importance in

laundry tubs. With a washing machine used once a week and stored in a dry place the tendency of the wood to decay would be so slight that Douglas fir should be suitable. If the wooden part of the machine is encased in a tight metal casing so that the wood might remain permanently moist the cypress would be preferrable.

Shrinkage or swelling of the wood is the other feature calling for attention. Such changes in the size of the pieces are due to the contraction or expansion of the cell walls of the wood structure which changes occur as a result of change in the moisture content of the wood. The shrinkage of a piece of lumber tangentially to the annual rings is about twice as great as it is in a radial direction, that is, a line running through the centre of the tree. Lengthwise in the piece of lumber the shrinkage is very slight.

Water exists in wood either as free water content in the cell cavities or as water absorbed in the cell walls. When wood contains just enough moisture to saturate the cell walls it is said to be at the fibre saturation point. Any water in excess of this which the wood may contain is in the form of free water in the cell cavities. Removal of the free water has no apparent effect upon the properties of the wood except to reduce its weight but as soon as any of the absorbed water is removed the wood begins to shrink. Since the free water is the first to be removed shrinkage does not begin, as a rule, until fibre saturation point is reached. For most woods the fibre saturation point corresponds to a moisture content of 25 to 30 per cent of the dry weight of the wood. If wood below the fibre saturation point is allowed to absorb moisture it will swell. This swelling for most woods reaches its maximum at the fibre saturation point and further absorption of moisture has no effect on the size.

It would not appear that the differences in shrinkage of Douglas fir as compared with that of cypress should be of sufficient extent to make the fir unsuitable for the manufacture of tubs. The shrinkage of the two woods when compared in different ways is as follows:—

	Per cent Shrinkage		
Kind of wood	In volume	In radial direction passing through centre of tree	In tangential direction at right angles to the radial
Cypress	11.5	3.8	6.0
Douglas fir	11.6	4.5	7.0

Shall All Lumber be Grade-Marked?

Definition of New Lumber Grading Standardization Program—Requirements of Wood-Users the Basis for New Grades—All Lumber to be Branded and Grade-Marked?

By J. F. Hirt*

Standardizing nomenclature is the engineering term for establishing a common language or common term of expression. When an industry lacks this first fundamental principle, it is obvious that very little if any progress can be made, and this is the very condition existing in the wood-using industries.

The automotive industry, although one of the latest to spring into prominence, is already far ahead of those in the woodworking field, and the remarkable achievement of the motor car manufacturers can without question be credited, in no small measure, to the able pioneer engineers and their successors, with whom they surround themselves.

The wood-using industries have been waiting patiently, often dispairingly, for the day when the manufacturers of the raw material they use would recognize the necessity for the standardization of grades and sizes or multiples thereof, which they could understand and which would more closely conform to their requirements. But they have been told that "it can't be done", the Lord Almighty grows the trees with all the variables which must be passed on to them. No one will question that variables exist and we all agree that they are great, but we are not quite so willing to agree that they cannot be reduced to conform to properly defined standards.

There are variables, and even variables of variables, in the raw materials used in practically all our industries. The leather using industries do not buy their raw material on a few vague and indefinite grade names, without any identification marks. The variables here are reduced to the most practical and economical point by the manufacturer, who produces first and foremost to the particular requirements of the various industries using his product.

The greater the number of industries using one basic raw material the more complex are the variables that enter into the manufacture of that raw material, and although lumber is one of the most outstanding examples, practically nothing has been done in the direction of standardization.

Present Definitions Vague

For all they mean, the present vague grade definitions could just as well be expressed as, excellent, good, fair, medium and poor. A. No. 1 common board may be required to cut 66-2/3% clear but this means nothing because we do not know the use to which it will be put. It will cut clear according to the sizes and quality requirements of one or more industries.

In the past, wood-using manufacturers have been much safer in carefully selecting their lumber manufacturer or dealer than in considering grades, simply because grades varied more according to the honesty and integrity of the latter than to any other factor. This is a deplorable situation and has continued to exist only because of the lack of concerted action either by a group of wood-using manufacturers or by the lumber manufacturers themselves. Perhaps if the people of this country had known that every time they bought a piece of furniture containing, say,

*Vice-president, Forest Products Engineering Co., Manhattan Building, Chicago.

twenty-five feet of lumber, they have actually been paying for more than seventy five feet, this condition would not exist today. Not only this but the cost of the skilled labor used in working up this waste is even more staggering.

When the U. S. Secretary of Commerce, Hon. Herbert C. Hoover, suggested to lumber manufacturers that their efforts be directed toward standardizing sizes and nomenclature, determination of a system of grade branding and other means for affording protection of the public, he may not only have known more about these conditions than the dissenting minority would lead the public to believe, but he has actually prepared and laid a foundation for the emancipation of the lumber industry, which will soon be productive of noteworthy economies to all concerned. The problems should, however, not be considered a mere routine chore; it will take years to establish an efficient grading system and in addition, the requirements, just as in other industries, will change from time to time as old stabilized products are eliminated from manufacture and as new ones are added. The establishment of clearly defined grading rules will only be brought about by giving equal consideration to the available supply of timber and to all the finished products manufactured therefrom.

Why Dimension is Not Successful

It is evident that mill cuttings will need to be as near clear as usable as it will be found practical to make them. On the other hand, there is at least one objection to the manufacture of dimension stock. Dimension stock is not yet successful because there is no simple, practical method of kiln drying it. Every board produced will usually develop some end checking as the inherent moisture leaves it and the resultant shrinkage takes place. Consequently, the longer the board the less waste in per cent of the whole will result from end checking. This problem, therefore, must be taken into careful consideration until such time as it may be found more economical to dry lumber scientifically, green from the tree.

There are only a few large manufacturers who can at present hope to profitably manufacture dimension stock according to recently established practices and these few must undertake and succeed in proving to wood users the merits of this stock through more disinterested channels than their own organizations. If we want to consider dimension stock as making not only one unit piece but any number of multiple units, then the term will fit our new grading systems to a considerable extent, but it would again be a general term leading to more confusion and therefore, should be avoided in the interest of standardizing nomenclature or grade terms.

How to Establish a Grading System

In order to establish a grading system that will be of real tangible value, it will first be necessary to prejare the following data.

1. Make a complete engineering product analysis of all articles made of wood in all industries. This will consist of: (a) Dissecting each article into unit parts; (b) classification of all parts according to the kind of wood and dimensions; (c) Tabulation of manufacturing operations performed on each part and in the sequence they are performed. The purpose of this engineering analysis is, first to determine accurately the raw material requirements of all the wood-using industries and, second, to determine the labor that will be saved by a proper grading system.

2. Standardization of sizes: (a) According to products of the various industries. This can be accomplished through enlisting the co-operation of architects, designers and construction engineers. (b) According to the available timber supply, for not until the requirements of the wood using industries are known, can they be intelligently filled.

It may be helpful to indicate how chats can be developed which will enable the lumber manufacturer to cut logs of all descriptions most economically and although each industry has its own individual practices and therefore can not be used as a concrete example, an interesting illustration is found in the method by which the packing industry classifies and cuts beef. Instead of showing the cuts from the logs by name as in cutting beef, it will be necessary to indicate the various boards in the log charts by grade name, each one giving the optional cuts to make.

Practical mill men decide their cut now according to their own individual ideas, and it is unnecessary to state that there are many different ideas. As there must be one best way, why not determine which one that is and standardize it? When a grading system has been established, lumber should certainly be marked strictly in accordance with it. There is, however, every reason for not grade marking while the present vague system of grading is in effect

No Real Objections to Grade Marking

The objections to grade marking are not consistent. The legitimate lumber dealer does not fear this practice and those who still object take a look around and see other materials are manufactured so near to the completed product as lumber, that do not bear the grade and trade mark of the manufacturer.

It would be a fine state of affairs if when we walked into a cigar store we found the shevles and show cases filled with open boxes none of which were labelled or marked. The dealer may or may not be honest and if asked for "No. 1 common" the chances are he might hand us a "No. 2 common" rather than a "Select" or a "First and Seconds." There is likely no other commodity we buy regarding which we are given so little information as in the case of lumber.

Manufacturers are always proud of their trade marks and there is this one point for dealers to consider; trade and grade marks have never put anyone out of business. The reputable dealer is quite proud and profits most when he handles a high grade line, but the Canadian people are not quite willing to take the dealer's word that the goods are high grade. They would rather judge by the grade and trade mark.

Death of Robert S. Harmer

Robert S. Harmer, one of Canada's most prominent manufacturers, died at his home in Connaught Circle, Cedarvale, in his 70th year. The late Mr. Harmer was president of the Canada Furniture Manufacturers, Woodstock, Ont., and the Seaman, Kent Company, Toronto. He was born in England and came to this country when a boy.

When it is necessary to throw a belt off a moving pulley, put the stick against the part of the belt which is travelling to the pulley, then press against it, and it will guide the belt from the pulley.

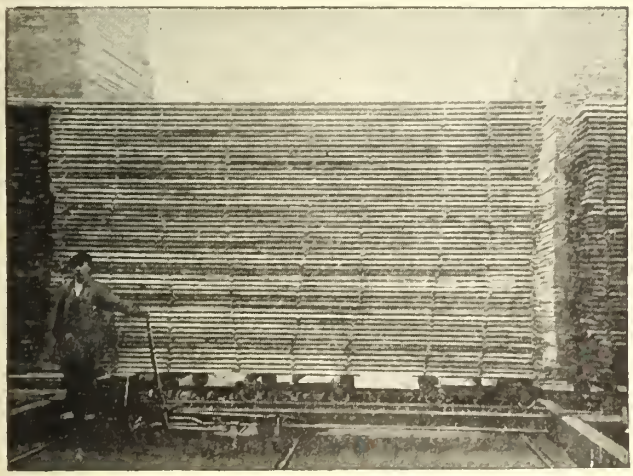
Save Five Men and Two-Thirds the Time

In Handling Lumber in the Yard and Transferring it to and from the Kiln—An Electrically Operated Transfer Car Reduces the Cost of a Heavy and Risky Operation

How do you handle lumber in the yard and transfer it from yard to kiln? Do not follow the ordinary method which is somewhat as follows:—The yard foreman has to get all his men together who are scattered in various parts of the yard—some are on top of a high pile, others in lumber cars, others stacking.

The old way—hand power

By the time he has obtained his crew of six to eight men, considerable time is lost. Then they start tugging and pushing the loaded kiln car to get it on to the transfer car. In the winter it is often necessary to first clean away the snow and ice before the men are able to move the car, and then oftentimes it is



The new way—electric power

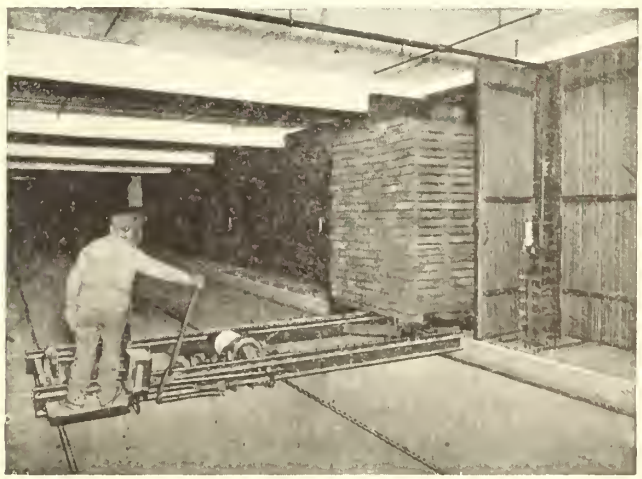
necessary to send to the mill or elsewhere for additional help. Finally the car is moved on to the transfer car and started on its way to the dry kiln—always a slow, drawn-out operation. Eventually the car is spotted in front of the kiln and again the positions of the men are changed to start the loaded kiln car into the kiln. This is frequently a dangerous job on account of the fact that the kilns have no floors. In many cases it takes as long as four hours to change a single kiln and about the same time to unload one.

Does the above description tally with the procedure adopted in your yard? If it does, you are no different from hundreds of other millmen who have to use a method so wasteful of time and money. It means heavy work for the men, frequent delays through stoppages or accidents, and a considerable element of danger. All these help run up that factor in your cost of operation known as "yard burden."

The illustrations show a method by which the handling and transferring of lumber in the yard can

Pulling a loaded kiln car on to a Pullman transfer car, by one man

be accomplished with one man through the medium of an electrically-operated transfer car which has been put on the market by the Pullman Coach Co., Chicago. It is stated by those who have made use of



Loading or unloading kiln by reversing motor only

this equipment, that one man can take a loaded kiln car of lumber from the yard to and from the dry kiln, to dry storage and out again, into the machine room, to any place to and from the yard in about one-third of the time now required by six to eight men. With the Pullman transfer car any size load, either cross

pile or end pile, may be pulled. When removing loaded kiln cars from the kiln, the operator simply hooks on to the loaded car and pulls it on to the transfer car. If he is loading the kiln, he runs the drum in a reverse direction and pulls or pushes the load into the kiln.

The car is electrically operated, the current being supplied by a three-finger collector system, by overhead trolley or by extension cable. The motor and all mechanical parts are protected from the weather, and while very compactly arranged, are easily accessible for adjustment.

Should the Special Millwork Plant Buy or Manufacture Its Stock Millwork?

Plants Equipped for Special Lines can Hardly Make Stock Goods at a Price Comparable with That for which They can be Purchased—Certain Considerations, However, Favor the Production of Standard Items by Special-Work Mills

By H. S. Sawyer*

In submitting a paper on the subject"Should the Special-Work Plant buy or manufacture its Stock Millwork" it seems to me there is presented a problem in which we are deeply interested and one that has caused many of us a lot of worry. If we consider the side of buying the items of sash, doors, mouldings, frames and some of the standard sizes of cabinet work, I believe a majority vote would favor this action. There is not one of these items that can not be purchased from some one at a lower price than would be our cost of manufacture. For the special-work plant to attempt to make stock doors and sash at a price in line with what they might be bought would be an impossibility. First on account of quantity production due to equipment and routine system of the stock plants and also to the difference in wage scales of the workers the special work plant would have to use. Conditions existing in different plants or localities would undoubtedly modify such conclusions on some items. One might have such a diversity of frames to make that the investment in lumber would be a considerable item. If the stock frames were made it would result in a quicker turnover and a reduction on overhead in this department.

Stock patterns of interior mouldings can be also purchased at lower prices than our manufacturing cost but uniformity of pattern combined with condition of finish in which these are delivered to the contractor will govern largely the purchase of this material. On cabinet work we find the same to be true; any standard layout can be purchased at prices that to the special plant would be suicide. We should consider, however, there are slack times in the special plant when the making of stock mouldings and certain kinds of case work could be utilized to keep together the organization and save in operation expenses.

Reputation on a Quality Product

These points as considered are all based on the immediate dollars and cents return but we know this is in some cases the short-sighted policy. The reputation of a concern of furnishing a high class product and maintaining such a standard will assure the future of the business and should be the object to be obtained. Will then the manufacture of many stock items, which will be recognized as the product of the concern, outweigh the difference in the cost of production? Here is where another point that has given me concern might be considered, the growing tendency of lumber yards to stock all of the above items that constitute most of the mill work requirements of moderate priced homes. If Mr. Millman indicates by his example that the purchase of K. D. frames, yellow pine trim, outside mouldings as well as sash and doors are satisfactory for the trade he supplies, then Mr. Lumber man is fortified with a strong argument that his stock is just as good. The lumber dealer has in many cases the first chance at the house bill and will naturally be able to sell many jobs if the owner or contractor thinks he is getting equal service. As I said before, the reputation of the mill on the class of work furnished will have a bearing on the amount of this business that can be controlled. Consideration of this must be given in deciding how far to go with the purchase of stock materials, or the special plant will face the problem of adding lumber to its stock to meet this competition.

I wonder if the difficulty in adjustment of operators' wages to present living conditions may not have some bearing on the need of purchasing as much of the stock items as possible. Certainly the workman must be made to see that unwillingness to recede from the high point of the past few years in his pay will force the special plant to make less and less of the stock items and therefore loose to these workers a part of their employment. The special-works plants we are considering are the ones located in cities where their business includes furnishing all the items of millwork that enter into the building activities of their city. This means that the volume of sales is greatly affected by the amount of stock material they sell. To me it therefore seems a case for the individual to decide what he must do, either buy all he can and take his chance on holding his share of the stock work against all competition on these items, or limit his buying and build his reputation on a higher service of product which will command a higher price.

Deep gullets does not mean fast cutting, but is always results in a weak saw.

Emery wheels and all grinders which make a good deal of abrasive dust should be lubricated by grease forced into the bearings by brass or iron cups.

Should a large saw have a riving knife? It depends, but as far as possible, every effort should be made to use one on every saw bench.

*President, Sawyer and Georgens Co., Joliet, Ill., before the Millwork Cost Bureau.

Bringing the Machine to the Job

Portable Bench Woodworking Machinery Opens the Way to Cutting Costs in the Woodworking Plant—Operations Hitherto Performed by Hand May Now be Handled by Machine

Back there in the early days, when the man who originated the idea of portable bench woodworking machinery was still operating a large pattern shop he often wondered how much time was being lost by each one of his men in walking to and from the large stationary machines, changing the set up, starting the motor and often waiting for other men to finish using the machine.

How much more convenient, he began to think, it would be to place machines at the bench where the man was working thus saving the time lost in travelling over to the machine. Another idea seemed to link itself with the first idea and should be considered in connection with the idea of moving the machine to the job—that idea related to the size of the work to be done on the machines. There is a lot of work done at the benches by hand because this work (and it is the planing and cutting of smaller stock incident to assembling and fitting in cabinet as well as pattern work) cannot be done on large machines; the work is too small for the large throat openings and consequently accurate and safe operation is not possible. Linking these two ideas together, the scheme is to do as much of the work as possible at the bench and avoid travelling to the big machines so often, using a smaller machine so that this work which was being done at the bench by hand could be done on machines.

There were no machines on the market at that time except the larger ones, consequently, this man found it necessary to design and make a number of small planers or jointers. He decided upon a planer four inches wide as one of the ideal size to supplement the larger jointer and to make it possible to do at the bench a lot of that work they were doing on large machines and also that work of planing, fitting, jointing, etc., which they were doing by hand.

Operates From Electric Light Socket

He built twelve and placed one between each two pattern makers. He equipped them with small fractional horse-power motors so that they would operate from the electric lighting circuit and not make it necessary to run a power line to each bench. The fact that these machines operated from the light circuit was found later to be a great convenience, for the machines could be taken anywhere about the shop or out on jobs and operated wherever an electric light socket was available. The time thus saved in his shop by these conveniently located machines and the fact that a lot of work was being done more accurately and quickly, by machines, soon made it possible to cut down the labor charge on the job work and resulted in his being able to turn out better work at a lower cost.

There was no thought of going into the business of manufacturing machinery in the mind of this man who originated the bench machine idea; he made the machines for his shop and that ended it, but you cannot hold back a good idea—it is bound to live. Therefore, it was not long until other manufacturers, realizing their disadvantages without equipment that prevented so many trips to the big machines and made it necessary to do so much work by hand, urged our friend to make machines for them. The result was that he did and today is in that line of business exclusively.

The demand for the planer grew rapidly but the idea spread and requests for machines for other operations began to come in and from a great variety of industries.

Today you will find these planers, small jointers, circular and band saws in thousands of pattern, cabinet and carpenter shops, furniture factories in the designing, upfitting, cabinet, assembling and shipping departments, sash and blind plants and shipping rooms; in fact wherever wood is worked you are bound to find these machines saving wasted steps and hand work. Hence carpenters take these portable machines with them wherever the job may be, plug them into the electric light socket and work. Warehousemen send the machines out on jobs and cut crates to fit the pieces they are packing, etc. In the six years that the manufacturer referred to above has been manufacturing portable bench machinery he has sold over fourteen thousand machines.

Sturtevant's Unique Catalogue

B. F. Sturtevant Co., of Hyde Parke, Boston, Mass., manufacturers of the high humidity dry kiln, have recently issued an attractive publication entitled "The Question and the Answer." The edition is remarkable by reason of the construction of the cover and fly-leaf. The cover is a real wool veneer with a paste board and paper backing. It is a product of the Japanese art. Besides being of interest to the lumber industry, the specimen is of particular concern to the veneer people.

To Make Motor Bodies

Messrs. E. Nicholson & Son, of St. Catharines, Ont., who have been in the building and contracting business for the past 40 years, have branched out into the manufacture of commercial motor bodies including hurses and omnibuses and have extended their premises which now include a blacksmith shop, paint shop and auto body building shop. Business is reported as brisk and further additions are contemplated shortly.

If you have a very large number of machines and only one-third are worked, the cost of running them is far greater than those run in a smaller mill plant.

The joiner who imagines that he can do better hand work than any machine has not seen some of the best work done by machinery.

Does the belt always run to the highest side of the pulley?

How do Common Styles of Boxes Compare?

The Advantages and Disadvantages of Seven Types of Nailed Wooden Boxes That May be Regarded as Standard, are Described in a Bulletin of the Forest Products Laboratories

There are seven forms of nailed wooden boxes so universally used that they may be called the standard styles of nailed boxes. These boxes can be adapted to a wide range of uses, and it is the experience of the Forest Products Laboratory, Madison, Wis., that in meeting the majority of packing problems they are the most efficient of the nailed boxes. The advantages and disadvantages of each style, as revealed in laboratory tests and observations of boxes in commercial service, are given below.

In style 1, the grain of the ends and sides runs approximately parallel to the top and bottom surfaces. One of the common failures in this type of box is splitting of the ends and sides, or failure of the joints in these parts, since the only resistance to such failure lies in the strength of the joints, if present, or in the strength of the wood in tension across the grain, which is not large and is extremely variable in any species of wood. The smaller holding power of nails driven into end grain as compared with side grain is another source of weakness.

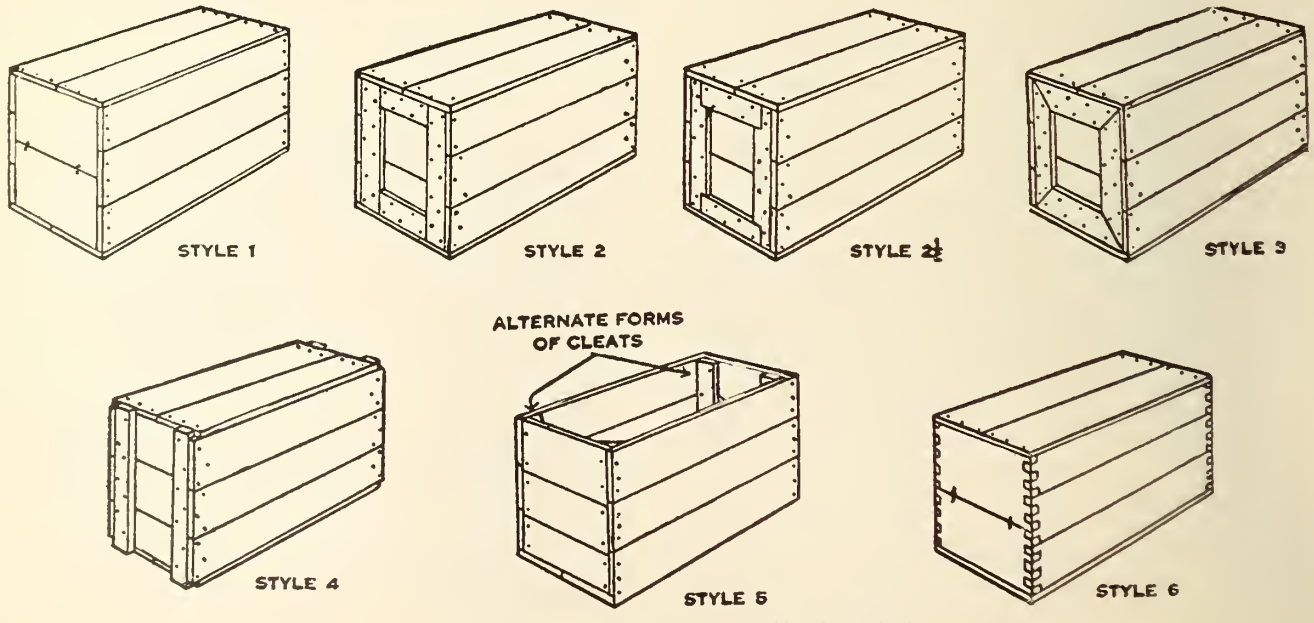
To improve on style 1 ends, and guard against the liability of complete failure from splitting of ends and sides, rectangular and sometimes triangular corner cleats nailed to the inside of the end (style 5) are added when the character of the contents permits. This construction does not increase the displacement of the box and is, therefore, not objectionable in that respect. If these cleats can be made large enough, the sides may also be nailed to them, which, of course, increases the strength of the nailing at this point. These inside cleats should be shorter than the inside depth of the box, so that if the sides and ends shrink, the cleats will not cause an opening of the joints. In all boxes with cleated ends, the nails holding the cleats to the ends should be long enough to permit a good clinch, and should be spaced approximately the same as the nails in the adjacent edges of the box.

Outside Cleats

The most common method of preventing box ends from splitting and of supplementing the holding power of nails driven into the end grain is the addition of two outside cleats on each end as shown in style 4. These cleats should be of the same thickness as the end so that the same size of nail may be used in them. The nails should be staggered in the ends and cleats; this permits a closer spacing of the nails and results in a stronger joint than is obtained by driving the nails in a single row. The holding power of the nails is supplemented most effectively by the use of denser woods in ends and cleats.

The cleats in style 4 boxes should be long enough to come nearly flush with the outer surfaces of the top and bottom. They will thus aid in keeping the top and bottom in place and will also take some of the thrust which comes on the nails in the top and bottom when the box is dropped on a corner. If the cleats are made to come exactly flush with the outer surfaces of the top and bottom, and shrinkage occurs later, it may cause the ends of the cleats to project beyond the top and bottom, and they may be pulled loose if the box is handled so that they catch on some object. The amount that the cleats should be cut short to allow for shrinkage depends on the moisture content of the lumber at the time the box is constructed and the storage conditions afterward. Usually an allowance of from 1/8 to 3/16-in. at each end will be sufficient.

The addition of the two horizontal cleats in styles



Seven styles of boxes that are considered standard

2, 2½, and 3 permits a reduction in the thickness of the end boards from the thickness of the cleats to that of the sides, top, and bottom, in which case all the nails should be driven into the cleats. Or the cleats and end boards may be the same thickness and the nails staggered in two rows. The usual failures in these styles of boxes are pulling of the nails from ends and cleats, shearing out the nails to the ends of the sides, top, and bottom, and splitting of the end boards along the inner edges of the horizontal cleats, which allows a cleat with part of the end board to pull away with the top and bottom. The resistance to failure by splitting of the end is due to the strength of the end board in tension across the grain, supplemented by the action of the vertical cleats. In nailing the vertical cleats to the ends in styles 2 and 2½, it is possible to get more nails near the top and bottom edges of the box than in the mitered cleats of style 3. This more effectively prevents the box end from splitting along the horizontal cleats.

Thrust Taken by Cleats

Style 2½ has the advantage that when the bottom and top are being nailed to the cleats, the notches or steps in the vertical cleats will take the thrust that otherwise would come on the nails holding the horizontal cleats. This thrust is sometimes very severe, especially when several nails are driven at the same time into a cleat made of dense wood.

In manufacturing boxes with square ends, style 3 has the advantage that all four cleats are the same length, hence interchangeable. When a very symmetrical end is desired rather than the strongest end, the mitered cleats are preferred.

The box shown in style 6 has sides and ends joined together by a series of tenons, called "locks," which interlock and are held together by gluing. The top and bottom are usually fastened by nailing. The lock corner, if properly glued, gives a more rigid box than nailed corners, there being no appreciable distortion before failure occurs. Tests show that many failures in lockcorner boxes occur because ends and sides split, nails pull from or split edges of too thin ends, locks open, and matched joints lack sufficient strength.

Reducing Accidents by Adequate Protection

Efficient Guarding of Woodworking Machines—Regulations Covering This Important Work—Accident Prevention Live Issue—Result in Lower Compensation Assessment

A number of safety regulations, the nucleus of a code of protection methods for woodworking machinery, were recently drawn up by the Safety and Welfare Committee of the Industrial Council for the British Building Industry. These cover in a very thorough manner the protecting and guarding of a number of machines found in nearly every woodworking plant. Safety is a live issue in all branches of industry and the following recommendations, not only show the thoroughness with which the British engineers have tackled the subject, but may contain a few practical suggestions that will be found worthy of emulation:

Definitions.—"Woodworking machine" means a circular saw, plain band saw, planing machine, vertical spindle moulding machine or chain mortising machine operating on wood; "circular saw" means a circular saw working in a bench (including a rack bench) for the purpose of ripping, deep-cutting, or cross-cutting, but does not include a swing saw or other saw which is moved towards the wood; Plain band saw" means a band saw, the cutting portion of which runs in a vertical direction; "planing machine" includes a machine for overhand planing or for thicknessing or for both operations; "within reach" means within 6½ ft. from the floor or from any other point to which any person has access while the machinery is in motion; "underground room" means a room any part of which is so situated that half or more than half the whole height thereof measured from the floor to the ceiling is below the surface of the footway of the adjoining street or of the ground adjoining or nearest to the room; "gauge" means the British Standard Wire Gauge.

Part 1.—Duties of Employers.—(1) Every woodworking machine shall be provided with an efficient stopping and starting appliance, and the control of this appliance shall be in such a position as to be readily and conveniently operated by the person in charge of the machine.

(2) Every shaft, wheel, pulley, strap, band, or other device within reach by which any part of a woodworking machine receives its motion shall be securely fenced.

(3) Sufficient clear and unobstructed space shall be maintained round every woodworking machine to enable the work to be carried on without unnecessary risk.

(4) The floor surrounding every woodworking machine shall be maintained in good and level condition, and as far as practicable free from chips and other loose material, and shall not have a slippery surface.

(5) No woodworking machine shall be worked in any place which, during daylight, does not receive sufficient natural light to enable work to be carried on without unnecessary risk.

(6) The means of artifical lighting for every woodworking machine shall be adequate, and shall be so placed or shaded as to prevent direct rays of light from impinging on the eyes of the operators.

(7) (a) No woodworking machine shall be worked in any underground room in which such a machine was not worked before the date on which these Regulations came into force. (b) From and after the date on which these Regulations came into force, no woodworking machine shall be worked in any underground room unless the room is certified by an Inspector of Factories to be suitable for the purpose as regards construction, light ventilation, and in all other respects.

(8) The temperature of any room in which a woodworking machine is being worked shall not at any time fall below 50 degrees. Provided that this Regulation shall not apply to a sawmill any side of which is open to the outside air, but the workers in such a

sawmill shall be protected as far as practicable from draughts by screens or other suitable means.

(9) No woodworking machine shall be placed in charge of a person who has not been fully trained at such a machine.

(10) Every circular saw and every planing machine which is in frequent use shall be provided with efficient exhaust arrangements so as to insure that all dust and chips are drawn away from the worker at, or as near as reasonably possible to, the point at which the dust and chips are formed.

(11) Every circular saw shall be fenced as follows: (a) The part of the saw below the bench table shall be protected by two sheet metal plates, one on each side of the saw; such plates shall not be more than six inches apart and shall extend from the axis of the saw outwards to a distance of not less than 2 inches beyond the teeth of the saw, and shall, if not beaded, be of a thickness at least equal to 14 gauge, or, if beaded, be of a thickness at least equal to 20 gauge. (b) Behind and in a direct line with the saw there shall be a riving knife, which shall have a smooth surface, shall be strong, rigid, and easily adjustable, and shall also conform to the following conditions: (i) The edge of the knife nearer the saw shall form an arc of a circle having a radius not exceeding the radius of the largest saw used on the bench, and shall be fixed at the level of the bench table at a distance of not more than ¼ inch from the teeth of the saw; (ii) for a saw of a diameter of less than 24 inches the knife shall extend upwards from the bench table to within one inch of the saw, and for a saw of a diameter of 24 inches or over shall extend upwards from the bench table to a height of at least 9 inches; and (iii) except at the edge nearer the saw, the thickness of the knife shall be at least equal to the breadth of the cut of the saw. (c) The top of the saw shall be covered by a strong and easily adjustable guard, with side flanges to protect the teeth of the saw. The guard shall be kept so adjusted that the flanges of the guard on the front side of the bench shall extend below the roots of the teeth of the saw. The guard shall extend from the top of the riving knife to a point as low as practicable at the front of the saw.

(12) A suitable push-stick, at least 18 inches in length shall be kept available for use at the bench of every circular saw which is fed by hand, to enable the work to be carried on without unnecessary risk.

(13) Every plain band saw shall be guarded as follows: (a) Both sides of the bottom pulley shall be completely encased by sheet metal or other suitable materials; (b) The front of the top pulley shall be covered with sheet metal or other suitable material; (c) All portions of the blade shall be enclosed or otherwise securely guarded, except the portion of the blade between the bench table and the top guide.

(14) No planing machine which is not mechanically fed shall be used for overhand planing unless it is fitted with a cylindrical cutter block.

(15) No planing machine which is not mechanically fed shall be used for planing overhand any piece of wood less than 15 inches in length unless a safe holder is used for such piece of wood.

(16) Every planing machine used for overhand planing shall be provided with a "bridge" guard capable of covering the full length and breadth of the cutting slot in the bench, and so constructed as to be easily adjusted both in a vertical and horizontal direction.

(17) The feed roller of every planing machine used for thicknessing, except the combined machine for overhand planing and thicknessing, shall be provided with an efficient guard.

(18) The cutter of every vertical spindle moulding machine shall, when practicable, be provided with the most efficient guard having regard to the nature of the work which is being performed.

(19) For such work as cannot be performed with an efficient guard for the cutter, the wood being moulded shall, if practicable, be held in a jig or holder of such construction as to reduce as far as possible the risk of accident to the worker.

(20) A suitable "push-stick" shall be kept available for use at the bench of every vertical spindle moulding machine.

(21) The chain of every chain mortising machine shall be provided with a guard which shall enclose the cutters as far as practicable.

(22) The guards and other appliances required by these Regulations shall be maintained in proper working order, and shall be kept in position while the machinery is in motion, except when, in case of a circular saw, the use of the guards is rendered impracticable owing to the depth of the wood being sawn. The guards shall be so adjusted as to enable the work to be carried on without unnecessary risk.

(23) Regulations 11, 13, 16 and 17 shall not apply to any woodworking machine in respect of which it can be shown that other safeguards are provided and maintained which render the machine equally safe as it would be if guarded in the manner prescribed by these Regulations.

Part II.—Duties of Persons Employed.—Every person employed on a woodworking machine shall: (i) use and maintain in proper adjustment the guards provided in accordance with these Regulations: and (ii) use the "push-sticks" and holders provided in compliance with Regulations 12, 15, 19, 20.

A Story of Two Orders

The National Dry Kiln Co., of Indianapolis, Ind., have recently sent out an interesting circular entitled "A Story of Two Orders," one the largest order for dry kilns ever placed and the other a very small one representing 60 cents. The announcement contains an illustration of sixty-six freight cars conveying National Dry Kiln equipment represented in the one order, and contrasted with this there is shown an invoice for two electric heater racks. The company state that the point they wish to emphasize in the publicity is that no order is too large for them to handle efficiently and promptly, and none so small that they do not appreciate it.

Box Business in British Columbia

Reports from British Columbia indicate that the demand for boxes and crates is heavier this year than it has been for some considerable time. Canned fish, fruit and vegetables containers for local use are taking up much of the box factories' time while a heavy export trade is also being built up, especially with Australia, New Zealand, the Straits Settlements and India.

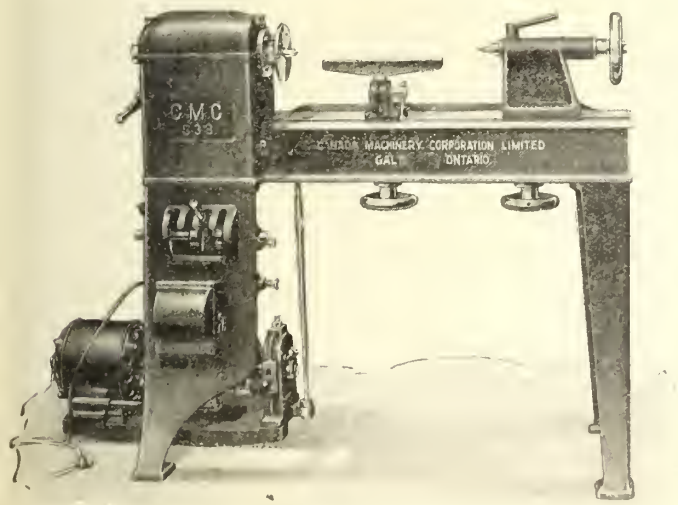
Machinery & Equipment

Manual Training Lathe

In keeping with the recent changes and improvements in the design and construction of woodworking machinery for factory use, the Canada Machinery Corporation, Ltd., Galt, Ont., have lately placed on the market their No. 838, 14" manual training lathe which will fill the requirements of educational institutions for a machine that, while meeting the peculiar needs of such institutions, also offers a machine built along the same lines as machines used in manufacturing. Not only is it suitable for manual training institutions, but it may also be installed in manufacturing plants where small and intricate turning is required.

This machine, which is illustrated herewith, is arranged for individual motor drive, the current being obtained from any electric light socket, but where more than one machine is required, they can be arranged to be driven in groups by a single motor supplying the power through an enclosed under-drive shaft.

In the design of this lathe, special attention has been paid to the rigidity of the bed and running parts. The cone in the head and the lower cone are both fitted with self-aligning ball bearings to insure ease operation. The bed and head are cast in one piece,



C.M.C. 14-inch manual training lathe

and by means of a special boring machine the head where the bearing is held is bored absolutely parallel with the bed to insure accurate alignment.

This lathe is ordinarily built with a 14" swing and a length of bed to suit individual requirements, but when so required, may be had in a larger size with a 20" swing. The spindle is of high carbon steel and arranged so that it can accommodate face plates at either end. When equipped for turning at the back end, a suitable floor stand support for rest is provided.

Ample safety for the student or operator is insured by completely inclosing the headstock and providing a wide flared left hand leg which completely covers the belt at all times.

Standard equipment furnished with the machine covers a variety of face plates, chucks, angle rests, centres and different lengths of "T" rests.

Electric Glue Pot with Rheostat Control

A glue pot with a rheostat control which permits an almost unlimited variation in temperature has been developed by the Westinghouse Electric & Manufacturing Company. The temperature of this new pot can be changed to meet different conditions, such as room temperature, climatic conditions, different grades of glue, or different kinds of work.

Some of the advantages of this device are the facts that the possibility of an unstable temperature, a frequent condition when gas is used for heating, is eliminated; a better grade of work is possible; and one cause of time waste is removed. The addition of the rheostat does not deprive the user of any of the advantages of the electric glue pot. It still remains portable since the rheostat can be laid on a bench or shelf, the cord from the rheostat to the glue pot being long enough to permit ample movement for ordinary bench work.

Westinghouse rheostat-controlled electric glue pot

The construction of the pot is rugged and simple throughout. The casing and bottom plate are made of heavy sheet steel and the glue vessel of heavy spun copper. The pot is of the dry type.

Hot Plate Veneer Re-drier

What might be termed a Canadian-made hot plate re-drier, is being manufactured by Wm. R. Perrin Co., Limited, Toronto, manufacturers, of hydraulic Veneer presses and is being distributed through the Garlock Machinery Co., Toronto. It is designed along lines very similar to the types of hot plate veneer driers, which are familiar to readers of the "Canadian Woodworker." The plates open and close in the well-known breathing movement. This permits the vapor to escape and also releases the pressure from the veneers so that the stock can shrink freely without any checking occurring. The first machine

to be manufactured is a six-plate drier with plates 54" x 84". However, the number and size of the plates can be varied to suit the needs of different plants. The necessity for having veneers and cross-banding thoroughly dry at the time of laying, is well-known to all veneer users. With equipment of this type, the moisture content of the veneers is reduced, and at the same time the pieces of veneer are straightened and dried in a flat condition. This latter point is an important one as it tends to facilitate the jointing, taping and laying operations, and also results in better joints being made. With a machine of this type the veneer user is always assured of straight, well-dried stock which means that he is in a position to produce a better veneered product and at the same time cut the cost down to a low level.

Proper Mill Arrangement and Equipment

This Millman Believes in the Single Storey Structure Constructed so that the Floor is Truck High to Facilitate Loading and Unloading—Heavy Machinery for Stock Production; Lighter Equipment for Special Work

What is the ideal design for a mill building and what equipment should it contain? This is a question the answer to which, largely depends on both the efficiency and the cost of mill production. It is well known that mills so laid out as to make impossible a continuous and direct course of material from start to finish, interfere very seriously with the volume of production and increase the cost of manufacture. Correct routing is indeed one of the essential considerations in a mill design, so that handling and rehandling might be reduced to a minimum. In this matter the location of machines has a very important bearing, but the types of machines used also affect productive capacity very considerably, the proper style of equipment to be installed depending for one thing on whether special or stock work is predominant. A very important subject is thus opened up in the discussion of mill arrangement and equipment. In this connection an interesting practical viewpoint was expressed at the recent meeting of the Mill work Cost Bureau by J. W. Most, vice-president of the Hurd-Most Sash and Door Co., Dubuque, Iowa, U.S.A., whose remarks emphasize such important ideas that they are published herewith:

As the mill buildings constitute a large and vital part of the factory equipment, consideration will be given first to the various types existing in our industry. Many operators have selected the one-storey building, which, with the saw tooth roof, affords an abundance of light and ventilation, while others prefer the two, three and four storey buildings. Many buildings are built with floor at grade levels, others with first floor truck high for convenience in loading and unloading from trucks and wagons, while still others are built with the first floor as high as seven feet above grade.

One Storey Type Most Efficient

In my opinion, the most efficient factory building for our line of business is the one-storey structure, constructed so that the first floor is on the level with the floor of a truck. In this type of building, the initial cost and upkeep of elevators is eliminated, and the space occupied by elevators and stairways can be adapted to productive purposes. The one-storey building also allows an ideal arrangement of machines and produces added efficiency by eliminating the cost of transporting the raw material to floors above and the returning of the finished product to the first floor. The one-storey building also permits of the very valuable feature of receiving the raw material at one end of the factory and effecting a continuous and direct course until delivered at shipping department, or store room. Those who, in the past, have been forced to contend with the frequent delaying of material during the process of manufacture, will appreciate the value of the one-storey building in eliminating this evil.

If possible, it is highly desirable that sufficient space be provided in the lumber department, so that lumber sheds and dry kilns can be placed to advantage and lumber carriers employed to transport lumber direct from the car to the lumber shed and kiln. The process of handling and rehandling by hand and by teams and trucks should be reduced to the minimum.

The equipment of the modern plant should include a steam plant suitable for furnishing steam for glue cookers, heat for glue room, steam for dry kilns, as well as power to generate electricity for individual motor-driven machinery and supply live steam for offices, so that in cold weather the offices may be utilized during periods that the mill may be inactive. Exhaust steam should suffice in most instances for factory heating. With modern steam facilities, it is possible to profitably dispose of the factory waste, such as sawdust, shavings, edgings, etc., and generate the current for motors at a nominal cost as compared with commercial current, especially where coal is used to produce the commercial current. If commercial current were to be used exclusively, the surplus offal would become a liability, for in many instances it is necessary to pay to dispise of the accumulation of this wastage. By employing individual motors instead of a steam driven plant the friction and load incident to line shafting is greatly reduced.

Selection of Machinery

In selecting the machinery, the type of equipment will vary according to whether odd or stock manufacture is contemplated. For the stock plant, the heavier, sturdy type of machine with individual motors for all arbors and spindles produces superior results. The manufacture of stock work is a mass production proposition, where volume is imperative and substantial machines that can be depended upon to withstand the grind of continuous operation should be utilized. While the initial cost of machinery of this nature may seem heavy, as compared with that of the lighter belt driven type, the outlay is justified when increased output is considered.

The diversified class of work of the special or odd millwork plant renders it impossible to produce a large number of units of work as compared with a stock plant and, therefore, the overhead or machine burden would be excessive in the event that the heavy

(Continued on page 92)

Upholstering and Trimming

Tapestry as a Furniture Covering

How this Upholstering Material is Manufactured at the Mills of the LaFrance Textile Co.—Weaving is a Fine Art Rather than a Trade

As an upholstering material hardly anything can surpass tapestry in the matter of artistic design, luxurious appearance or richness of color. Indeed by many furniture connoisseurs it is recognized as the ultimate in furniture coverings. Such being the case, it is of special interest to refer briefly to the progress that the art of weaving has made and describe how tapestries are produced under modern methods as exemplified in one of the largest and best known weaving mills.

The art of weaving is of such great antiquity and so general in its range over the entire earth that any inquiries as to its origin can be but useless, and any theory but hypothetic. Savage races, only a step above creation, have practiced it from time immemorial, and the cultured nations have vied with each

Preparing tapestry designs

other in its exercise until at the present time one of the most valuable assets of a nation is its capability to produce woven materials.

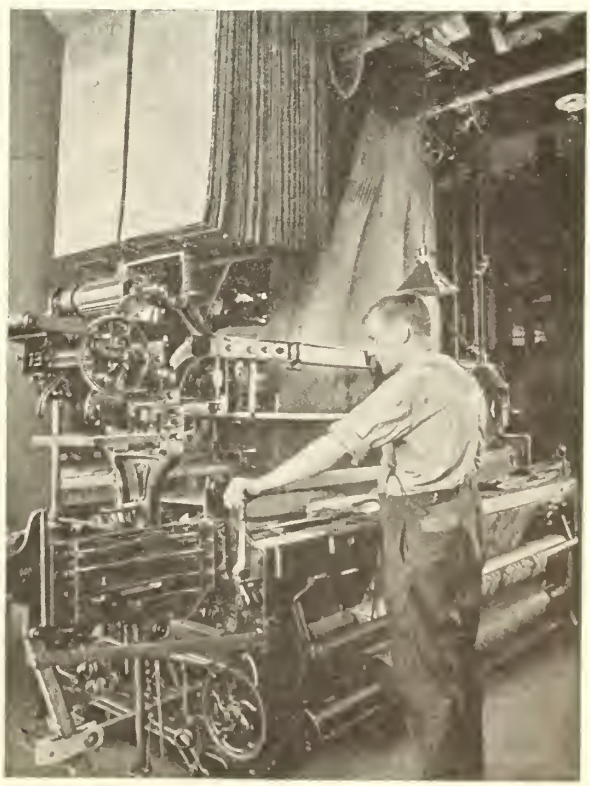
To the practical upholsterer an intimate history of the progress of the craft may, perhaps, be of only slight interest. Suffice it to say that there is a romance in the making of tapestries that appeals to the poetic, artistic and historic elements in our nature. There are records of the use of tapestry in the early classics while all down through the more modern ages, tapestry has played an important part in the life of nations. From the record of tapestry-making many facts and curious significant sidelights on history are provided.

Modern Methods of Tapestry Weaving

Tapestry weaving to-day is not the same process that was employed in bygone ages. In those times it was a household occupation where the individuality of each craftsman was evidenced in the products of

Punching the cards

his handiwork. These workmen were, indeed, real artists as only a cursory examination of historic tapestries is needed to indicate. In these modern times



Weaving tapestry. Note the cards above which constitute the pattern

mechanical methods have to some extent supplanted individual handiwork; yet withal there is in the mod-

ern weaving mill certain elements of individuality and artistic craftsmanship that give a romantic flavor to the art in spite of its mechanical background.

How the art of tapestry weaving is carried out, it is the purpose of this article to elucidate. For our purpose the mill of La France Textile Co., Frankford, Pa., is taken as being well able to indicate the processes involved in tapestry manufacture. A brief description of the processes is supplemented by illustrations indicating the various elements involved in the weaving operations and for the reproduction of which we are indebted to La France Textile Co.

The design of tapestry is drawn and then transferred on special blocked-out paper from which punched cards are punched by card-cutters. Remarkable results are accomplished through various colors in the warp and the colors of the yarn in the shuttles flying across the loom. Outside of these regular colors, various blendings and combinations of colors can

Twisting in a new warp

be obtained and very often it is difficult to foretell the results until the actual trial is made.

The setting of a loom which produces simultaneous weaving of the cloth in a range of colors and designs demands long and careful preparation. Many months elapse before a single yard of cloth can be turned out.

To the layman nothing is more mysterious than the ability to transfer the colors and designs from the sheets of paper prepared by the artist to the woven tapestry. This is where the invention of a color selector machine by a Frenchman, Jacquard, comes in. His system of punching round holes in a cardboard corresponding to the design of the artist, is what has given a mighty impetus to the tapestry industry.

Then the different yarns colored exactly to meet the ideas of the colorist are strung on the loom and controlled by the Jacquard system. These long ends of yarn are prepared on beaming frames, sometimes each thread being over one thousand yards long, and it is a special craft of its own to be able to lay the warps, the experienced beamers requiring many years of practice.

When these warps are used up, another beam takes its place, and to twist the threads in requires

(Continued on page 94)

Woven Curled Hair

Also a Full Line of
LOOSE-CURLED HAIR
In All Grades and Colors

Samples Cheerfully Furnished

BLOCKSOM & COMPANY

Sterilized Curled Hair

MICHIGAN CITY, INDIANA

Eagle-Ottawa Leather Co.

TANNERS OF

FURNITURE LEATHER

OF EVERY DESCRIPTION

We are making a specialty of cutting

Spanish Split Leather for Chair Manufacturers

Quotations and samples furnished on application

We will be pleased to supply a very attractive sample book, of all our grades on application.

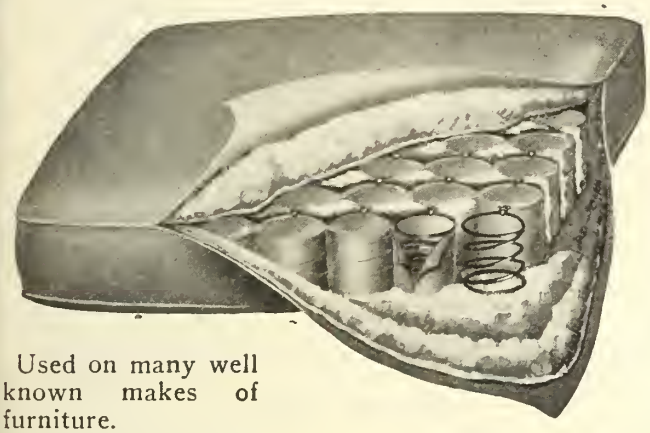
GRAND HAVEN - - - - - MICHIGAN

"COMFY" CUSHION COMPANY

Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.



Used on many well known makes of furniture.

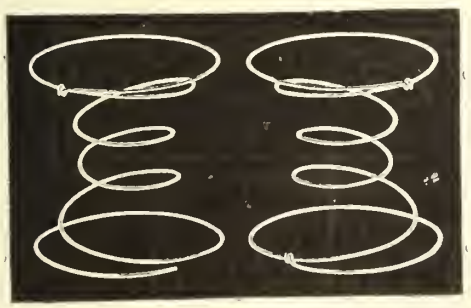
Write for Catalogue

"Comfy" Cushion Co.

340 Gerrard Street, East, TORONTO, Can.

"IDEAL"

FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,

of Canada, Limited

Windsor - Ontario

The

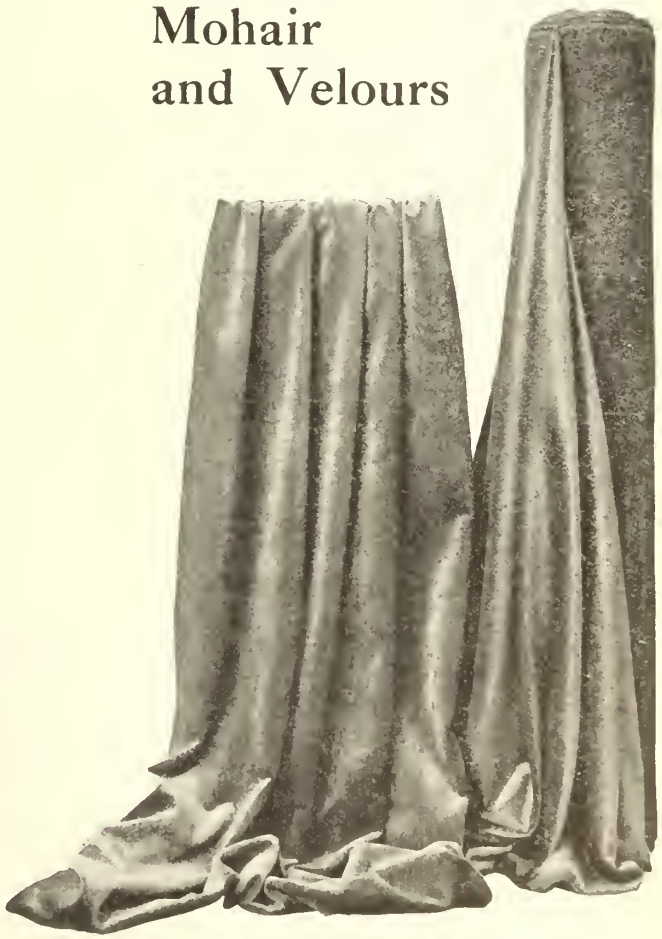
ORIENTAL TEXTILES COMPANY

LIMITED

Oshawa, Ontario

Manufacturers of

Upholstery
Mohair
and Velours



Agent

J. H. ALLEN

33 MELINDA STREET

TORONTO

DOON TWINES
D
MADE IN CANADA

—YOU ARE CORDIALLY INVITED—

To visit us at the Canadian National Exhibition, Booth No. 8, Manufacturers' Building.

When you have examined our exhibits, from the raw material to the finished twine, you will understand why

"DOON" TWINES STAND THE TEST

Booth No. 8 Remember!

DOON TWINES, LTD.

Mills at Doon and Kitchener

Head Office: Kitchener

MARIETTA WOOD AND METAL FINISH SPECIALISTS

Marietta Paste Wood Fillers

The largest talking machine manufacturer in the world uses Marietta fillers exclusively, the contract running about a carload a month.

Marietta fillers are made from the highest grade silex, linseed oil and special binders.

They have been in use in the furniture manufacturing field for a quarter of a century and can be depended upon to give highest satisfaction.

The Marietta Paint and Color Co.

Marietta, Ohio

Southern Factory - High Point, N. C.

"Save the surface and you save all"—*Paint & Varnish*

QUALITY

D&P

QUALITY

CURLED HAIR

GLUE

SANDPAPER

DELANY & PETTIT LIMITED

TORONTO.

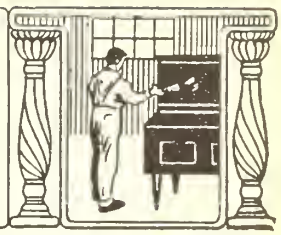
OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC

QUALITY

QUALITY

THE FINISHING ROOM



Cutting Your Rubbing Costs

Pay Strict Attention to the Woodworking and Sanding Operations—Often Possible to Save One or More Coats of Varnish

From fifty to seventy-five per cent of the rubbing costs can be saved through stricter attention to the preparation of the foundation for the varnish coats. This means a worth-while saving, for the rubbing operation usually requires more time than any other one finishing operation. As compared to filling the time is about four to one.

To the manufacturers and finishers the little details which require attention in preparation of the surfaces to be finished and in the earlier finishing operations may seem like unimportant trifles. It is said that perfection is made up of trifles, but perfection is no trifle. This attitude is seen again where an attempt is made to cut the cost of an article by purchasing a cheaper grade of varnish or cheaper grades of finishing material, overlooking the fact that the appearance and saleability of the article depends largely on the finish and that a well finished article often commands a premium over a poorly finished one. From this it will be seen that a few cents saved in the cost of the finishing material may mean a reduction in value, or at least in the selling value, of several dollars.

Varnish Not a Filler

But to get back to the question of reduced rubbing costs, we can accept as a fundamental principle the fact that varnish cannot be considered a filler in any sense of the word, and as a consequence, should never be depended on to fill depressions or to overcome any inequalities which may exist on the surface to be finished. Then to secure a suitable foundation, which means a smooth level surface free from depressions and inequalities,, for the varnish coats, it is necessary to go back to the woodworking operations and see that they are performed properly.

In the case of the planer, the knives should be sharp at all times and the shavings exhaust system must be able to carry away the shavings as fast as they are made. Depressions made by shavings getting under the cylinder knives, may be sanded out but the wood underneath has been compressed and is sure to expand when the stain is applied. This causes high spots on the stained surface which gives a considerable amount of trouble.

Needless to say, the sanding operation is extremely important, particularly the final sanding and cleaning. By paying closer attention to the surface produced by the various sanders it is often possible to eliminate one or more varnish coats. This is a point well worth considering. One coat of varnish upon a smooth even surface, that is one fully prepared, will give as good a finish as three or four coats upon a poorly prepared surface, with this advantage that in the case of the single coat on the good foundation the rubbing will likely be about one-fifth of that required on the heavily coated surface, with better results.

Viewing the various steps of the work in the light of their effect on the final varnishing and rubbing operations the filling of the pores takes on added importance. A little extra attention to the filling, such as sure that the filler is set before being worked off or particularly, that it is not rubbed out of the pores, will not only often save one coat of varnish and cut down the rubbing time to perhaps one quarter or one-fifth but will ensure a finish that is free from pinholes and similar faults.

One other suggestion is that when a piece or part is encountered, either in the final sanding or early finishing operation that is not in good condition, either rough, wavy, dented or sub-standard in some other way, it is far more profitable to throw it out without putting any more labor and expense on it than to put it through all finishing operations only to discard it finally or have to send it out knowing that it is not up to the mark. As intimated the finish is too important and its effect on sales and value is too strong to be neglected or considered in a haphazard manner. Perfection should be the ideal and goal and as far as finish goes perfection is made up of such trifles as have been outlined here.

The Cause of Green Cast on Mahogany Finish

Usually Attributable to Improper Filler and Stain or Manner of Applying Them—Varnish Sometimes Responsible

A producer of phonograph cabinets recently mentioned to the "Canadian Woodworker" the fact that he has been having considerable trouble of late with the finish of his mahogany, a greenish tone being very noticeable on one certain line of cabinets, and he asked us to give him some idea of the cause of this undesirable effect. This greenish cast on mahogany varnish finish seems to be very prevalent and a number of reasons have been advanced as to its cause, which are explained by various authorities and enumerated below.

The greenish tone, which appears to be fairly prevalent in dark finished woods, is usually attributed at first thought to the varnish, because it does not show up until the varnish coats are applied. The assumption, however, that the varnish is the sole cause of this defect is not correct, for probably in the majority of cases the varnish is not directly responsible for the greenish cast, but merely brings out defects in the condition of the stain and filler undercoating. It is a fact, of course, that some varnishes tend to affect the uniformity of the finish. Some of the darker colored varnishes, for example, have this greenish

effect in themselves when viewed in a reflected light. This is particularly true when several coats are applied. If the finish can be produced with less material, there is quite likely to be a complete absence of green. What will also help the defect in such a case is the use of a paler varnish or some tint color. One authority who has done some experimenting along this line also states that the use of too fresh a varnish tends to produce a greenish cast, since chemical action has not been completed in the varnish. The use of a pale, aged varnish absolutely overcomes this tendency.

If varnish is applied by a spray, there is a possibility that moisture may be playing a part in the development of the green color; certainly milky varnish indicates moisture. In such a case the gaskets of the compressor possibly leak, or the spray machine is held too close to the work.

Improper Filler and Stain

Regardless of the varnish, its color, price or the way it is manufactured, poor filler or improper use of filler and defective handling of stains may be productive of the greenish cast. One authority states that he has seen several cases where the shellac substitute coat or shellac coat has cut into the filler and stain in such a way as to take up some color and create the conditions which brought the green cast when the work was finished. This can be corrected by thoroughly analysing the staining and filling process to determine what must be done in the way of changing the stain or filler or the method followed to avoid the difficulty. Too much black, for example, in the filler and stain will produce this green cast every time.

Stain that is too strong will often produce a greenish cast if the excess color is not removed. A piece of cheesecloth dampened with alcohol and sponged over the work after it is sanded is quite effective in removing the surface stain. However, the only way to prevent this condition is to see that the color is thoroughly dissolved and the stain strained before application. Half an ounce of powdered alum to a gallon of stain has been found to be very effective in bringing the undissolved matter to the surface and aiding the straining.

Improper sanding is also stated to be a cause of green cast—especially sanding varnish that is not properly hardened or using too coarse a sand paper. The result is a grayish effect which becomes green on several re-coatings. There is another cause which is dependent on the result of the chemical action between the stain or filler and the veneer glue. This occasionally develops on dark finishes a cloudy or smoky effect which, when viewed in reflected light, shows decidedly greenish. With thin veneers, the pores are partly filled with glue when the work comes to the finishing department and so to a certain extent finish is built up on glue instead of wood.

The proper handling of paste filler in the package and in the pot is said by one authority to prevent one cause of greenish cast. The top layer of filler in an open kit or barrel will harden and oxidize in the same way as it hardens when properly placed in the pores of the wood. Such partial oxidized filler is bound to give poor results on the work and is difficult to rub off clean. The proper thing to do is to prevent the exposure of filler to the air by protecting this surface in the open package. Unless filler is rapidly used, it should be supplied in metal packages and not in wooden barrels as in that case some of the oil binder is absorbed by the wood and leaves the filler with an inadequate amount of binder. Such filler is harder to clean off and an excess filler usually produces a greenish cast on varnishes.

Will Decorated Furniture Survive?

Will Lose Favor if the Finish Is Not in Good Taste—Lack of Artistic Judgment and Finishing Knowledge Is Detrimental—Enamel Decoration, Stippled Finish, Polychrome and Japanese Lacquer

By W. C. L.

Decorated furniture will survive because of its merit, especially when executed as finely as some of the earlier masters, such as Adam Brothers, or as even the more crude but quaintly painted furniture of the French or Italian peasant style. The so-called painted commercial furniture, having too little regard for harmonious decoration and color, loses favor and there is but little place for its use in average homes other than in possibly sun or breakfast rooms. Refined Canadian or American tastes call for a harmony of color, and not so great a contrast of color in home decoration or dress as in a country like Italy where the very atmosphere is more luminous and colorful.

The commercial life of decorated furniture has suffered through the lack of artistic knowledge and appreciation on the part of the manufacturers—meaning also the men actually employed in the decorating and finishing departments. However, the ultimate effect is entirely dependent on the actual worker, no matter what the desire or ambition of the manufacturer may be.

The mixing of colors; knowing the process of antiquing effects on woods or enamel surfaces and the innumerable requirements of more artistic judgment are too little appreciated, studied or practiced by a finisher. Experiments in finishing departments offer much that creates new interest for him and gives knowledge that is of vital interest to the manufacturer. To know that French carved styles require but a shellac and wax finish to be more nearly correct; to know that practically every period originally had an individual finishing effect which can be reproduced successfully in a commercial way is appreciating one of the big factors that makes for individuality in many high grade furniture lines.

Importance of Finishing

At no time in the furniture manufacturing industry is finishing as important as to-day. Simple

Fifty Years as Manufacturers of Good Sandpapers

An Appreciation

To those who have so largely contributed to the success of Herman Behr & Company in its half-century of existence, we wish to express our gratitude.

To our Customers for their recognition and support and our Competitors for their progressiveness—invaluable incentives to merit the good-will of all.

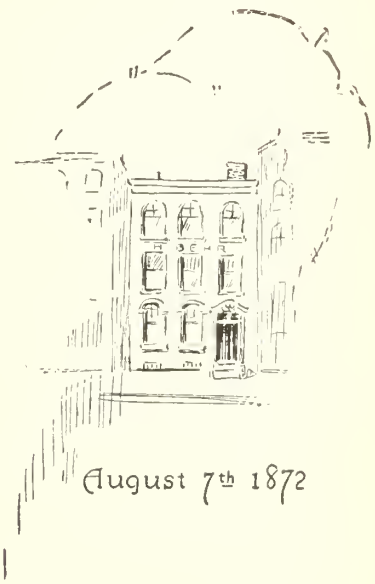
To our Employees—loyal and staunch, many of whom have been with us over forty years.

To our Founder for his ideals, inspiration, and steadfast adherence to the highest standard of quality and service during his entire fifty years as head of our Company.

And to all those who have helped create the enviable reputation which the Company enjoys today, we are grateful on our Fiftieth Anniversary.

HERMAN BEHR & CO., *Inc.*

BROOKLYN BOSTON CHICAGO ST. LOUIS
GRAND RAPIDS SAN FRANCISCO
TORONTO LONDON



August 7th 1872

Inventors and Sole Manufacturers of OPENKOTE *Sandpaper*

designs with careful selection of veneers and woods, together with a clean, clear finish are attempted by nearly all manufacturers but to finish a design containing a few colors of veneers and overlaps into a beautiful harmonious whole requires considerable skill and gives a manufacturer latitude for individuality. To follow this last effect and introduce black ebonized effects and antiquing shows the trend of thought in some high grade dining room and living room lines which will be followed by medium grade manufacturers soon.

The recent introduction of Span-Umbrian furniture shows an unusual example of skill in finishing. Few finishers would have the initiative or ability to create such a rare color scheme. Designers who have studied antique models of all the old schools, or have travelled extensively, readily grasp the sense of color and its application to various styles. They should be more and more called upon to pass judgment on proper coloring. More than that, they should be able to actually execute and supervise the sample work. They should uphold the artistic and more scientific points of construction and design. They should know much of chemistry, and should know the ingredients and effects of water or oil stains, varnishes, shellacs, etc., and keep posted on all the new finishes.

Finish Must be Right

Most manufacturers concentrate all efforts on merely turning out quantities of furniture and have little sympathy or regard for the likes or dislikes of the ultimate purchaser of his production. Some consideration should be given the fact that women buy and furnish most of the homes. With two pieces of furniture involving the same expense in manufacturing, the one having the greater amount of design and character naturally commands the greater selling price. Competition on mediocre characterless furniture is already too great. Here there is too much price cutting in normal times to see how little the article can be sold for. Individuality in furniture permits profits as it eliminates competitive buying through comparison. Furniture is not bought merely because it is either Chippendale, Hepplewhite, or of other periods, but because the design and finish is a happy, likable combination. Periods that do not sell either are not fully explored or cannot be made livable or commercial.

The Use of Overlays

The old schools usually inlayed broad bands or panels of veneer but a more recent development that has not been fully explored in a commercial way is applying an overlay of more choice and closely grained wood, showing contrast in color. Overlays on walnut or mahogany of Mexican cedar burls, ash burls, oak or English oak, walnut butts or burls, or bird's eye maple burls produce unusual and inexpensive effects that may either be ruined or enriched by proper finishing. These veneers are very porous and invariably finish either too light or too dark without extra attention. More filling or staining is necessary. However, walnut butts on mahogany or walnut are very pleasing with the usual stain and finish employed in the regular manner. Manufacturers of finishes willingly co-operate with the furniture makers to experiment and furnish proper wood or enamel colors that could not otherwise be secured when an expert finisher is not employed.

The tendency in high grade dining and living room furniture is to merely use light varnish, shellac or wax finishes. It requires extra care in the preparation of the wood surfaces but is more durable and practical.

The Italian style now being revived offers rich opportunity for securing rubbed off effects on carved or plain mouldings, sparingly carved rosettes, panels or turnings. Decorated furniture will always survive when the decorators show individuality. There is no medium in recent years that has given them such scope, especially when manufactured or finished under their supervision. This sometimes calls for special designs and some unique finishing effects wrought by enamel decoration and striping; stippled finish antiqued; polychrome (meaning many colors) or red, yellow blue or black Japanese lacquers.

Enamel Decoration

The primary coat of enamel is two applications of white lead undercoating, preferably the color which will be used on the outer coats. Ordinary white enamel mixed with the primary colors will secure every shade or effect one desires. The striping or decoration should be done in oil colors, after which a protective coat of white maple varnish should be applied. There is no limit to the possibility of new and beautiful combinations.

Stippled Finish

Stippled finish is having the second and third white undercoating brought to such a consistency that by applying a long, stiff-haired brush uprightly, the surface is made irregular like stone effect. A thin varnished coat of whatever color is desired is applied, after which sandpaper should rub off only the higher points of the stipple. This gives the two-color effect of the body and top coats. With added decoration and striping in various colors artistic effects are given. A preservative coat of maple varnish should also be applied.

Polychrome

Polychrome is usually applied on mouldings, turnings or carvings. The principal danger in this and practically all decorations is not keeping them properly subdued. The colors are ground in Japan. Chrome yellow can be used as a body color; Prussian blue with a little black, red or green added to give high lights. When nearly dry a porous bag,

(Continued on page 90)

Listen to this!

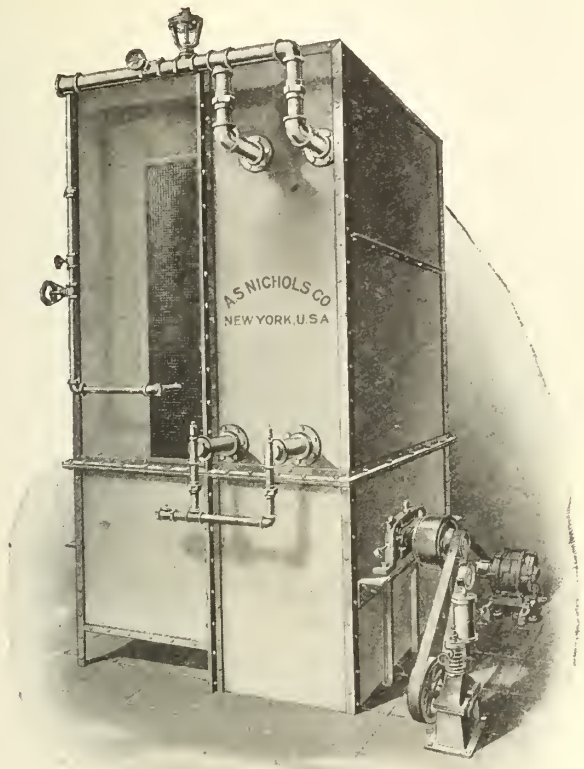
Your requirements in Reeds, Rattans, Turpentine, Cotton Waste and Cotton Linters can be promptly supplied by us at very attractive prices.

Write or wire your requirements.

Quotations gladly given.

E. T. CARTER & CO., LIMITED

84 FRONT ST. E., TORONTO



Vertical Equipment Floor Space 4 x 6 ft.
Crated and shipped complete ready to set on the floor outside of your varnish room

Set Outside Your Varnish Room

The money a Nichols Paint and Varnish Dryer saves will pay for the equipment in one year.

This is not a wild statement but one we have proved time and again to manufacturers in practically every branch of the woodworking industry.

The Nichols Vertical Paint and Varnish Dryer is a complete unit of fan, motor, heaters, air compressor, with automatic humidity and temperature controls. A new rotary, humidifying air washer which eliminates all dust and dirt and does away with all spray heads, pump and connecting piping.

The equipment is manufactured in sizes suitable for all requirements.

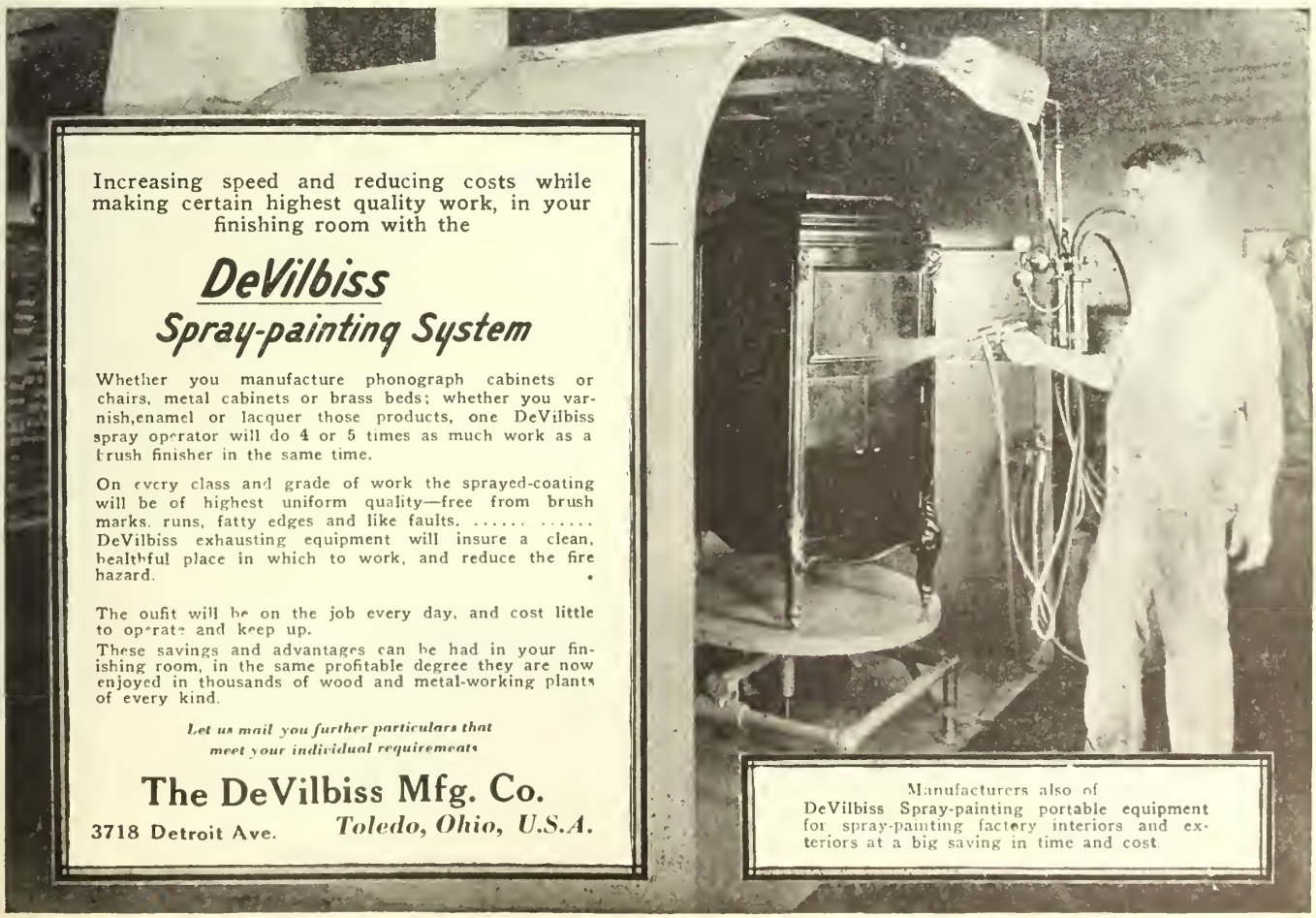
Let us analyze your particular needs and quote prices on same.

A. S. NICHOLS COMPANY

Aeolian Hall

33 West 42nd St., New York City

Manufacturers of dryers for lumber, veneers, glued stock, varnish, paints, enamels, etc.



Increasing speed and reducing costs while making certain highest quality work, in your finishing room with the

DeVilbiss
Spray-painting System

Whether you manufacture phonograph cabinets or chairs, metal cabinets or brass beds; whether you varnish, enamel or lacquer those products, one DeVilbiss spray operator will do 4 or 5 times as much work as a brush finisher in the same time.

On every class and grade of work the sprayed-coating will be of highest uniform quality—free from brush marks, runs, fatty edges and like faults. .... DeVilbiss exhausting equipment will insure a clean, healthful place in which to work, and reduce the fire hazard.

The outfit will be on the job every day, and cost little to operate and keep up.

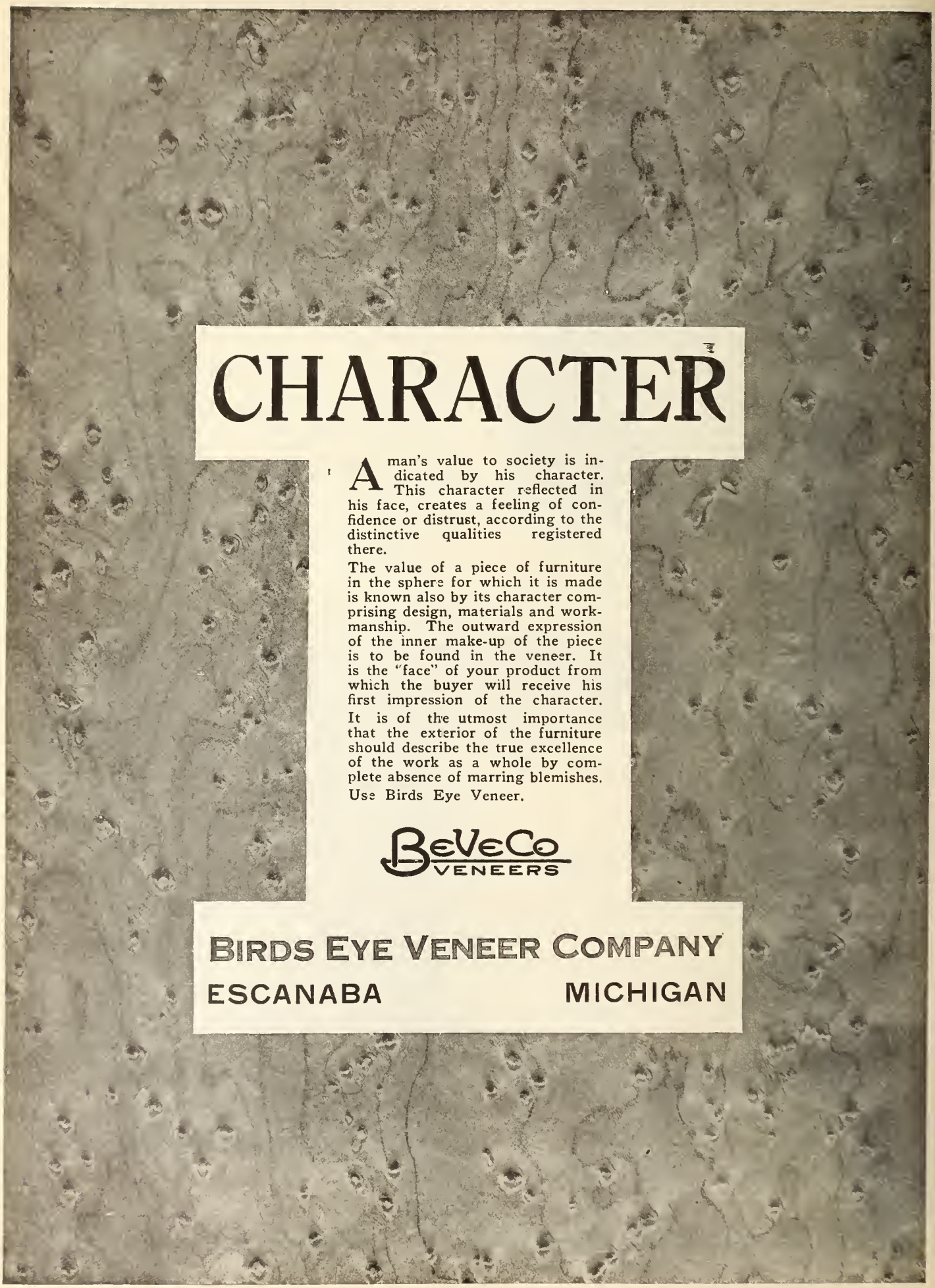
These savings and advantages can be had in your finishing room, in the same profitable degree they are now enjoyed in thousands of wood and metal-working plants of every kind.

Let us mail you further particulars that meet your individual requirements

The DeVilbiss Mfg. Co.

3718 Detroit Ave. *Toledo, Ohio, U.S.A.*

Manufacturers also of
DeVilbiss Spray-painting portable equipment for spray-painting factory interiors and exteriors at a big saving in time and cost.



CHARACTER

A man's value to society is indicated by his character. This character reflected in his face, creates a feeling of confidence or distrust, according to the distinctive qualities registered there.

The value of a piece of furniture in the sphere for which it is made is known also by its character comprising design, materials and workmanship. The outward expression of the inner make-up of the piece is to be found in the veneer. It is the "face" of your product from which the buyer will receive his first impression of the character.

It is of the utmost importance that the exterior of the furniture should describe the true excellence of the work as a whole by complete absence of marring blemishes.

Use Birds Eye Veneer.

BeVeCo VENEERS

BIRDS EYE VENEER COMPANY

ESCANABA MICHIGAN

Veneers and Panels

Glue Room Economy and Technology

Minimizing Heating Losses—Wastefulness Due to Bacterial Decomposition — Need for Glue Room Cleanliness

By R. H. Bogue*

(Concluded from the June issue)

If the evaporation of water from the glue which takes place on heating were made up by occasional additions of water it would very soon become apparent that the glue rapidly became thinner as heating progressed until it was altogether too watery to apply. In general, this decrease in viscosity or spreading capacity escapes attention and remains quite unobserved because of the fact that the same heat treatment which is responsible for it also results in evaporation of the water and consequent concentration of the glue in the solution.

One other point in this connection is worth attention. The loss due to heating has been found to be proportional to the temperature, increasing rapidly as the temperature rises from 140 degrees F. to the boiling point. The figures which have been given are based upon a heating at 176 degrees. But very often, where the temperature is uncontrolled, much higher values are reached, and not infrequently in fact, the glue is actually permitted to boil. A very few hours of boiling is sufficient to render the glue worse than useless for high- class joint or panel work.

It is obvious, therefore, that prolonged heating of a glue results in both a loss in strength and a decrease in the covering capacity. The latter, however, is concealed through evaporation of the water, and the loss in strength is usually unobserved on account of the excess in strength of the glue as bought above that necessary in the operation. The higher the temperature the more rapidly will depreciation take place.

The losses referred to may not be made good by the addition of water to make up that lost by evaporation, for the product would be too thin to spread properly, and would result in a weaker joint. All losses due to heating may, however, be minimized by dissolving only that amount which will be used immediately, and preventing the temperature from rising above 140 degrees F.

As soon as these simple principles are efficiently applied, a lower margin of safety may be confidently employed, which means a less expensive glue, or the same glue at a greater dilution, may be employed with equally uniform and satisfactory results.

The unsanitary appearance of the glue room with its disagreeable stenches is proverbial. It has been taken as a matter of course for so long that it is too often believed a necessary adjunct to the use of that substance. Glue pots in some places are never cleaned. The floor becomes covered with a gradually thickening layer of the spillings. But glue is an animal product and subject to bacterial decomposition. What wonder then, that the pots, the room, the new work, all imbibe the characteristic putrid odor! Probably the greatest number of complaints which are made by glue consumers to the dealers and manufacturers are based upon the affirmation that the glue in question is "sour." Investigation shows the pots and kettles to be coated sometimes inches thick with glue in an active state of decomposition that has been accumulating for months. It is doubtful if these same men would expect that sweet milk could be poured into cans containing decomposed milk without itself becoming sour very quickly, but they appear not to have applied that reasoning to the glue pot.

Putrefaction of glue takes place very rapidly at the temperature which obtain in the glue room. A sweet glue allowed to remain for a few hours in contact with decomposing glue will become sour, but that indeed is not the worst or only objection to permitting of such practices. A sour glue is not merely a glue that does not smell good, but it is a glue that

Efficiency in the Glue Room

The necessity of an intelligent control of all operations in the glue room, if efficiency in this department is to be attained, is the lesson conveyed in the three articles, of which the last appears in this issue, on "Glue Room Economy and Technology," by R. H. Bogue. Glue users in the woodworking industries are not always aware, we are convinced, of the wasteful and unnecessary abuses to which glue is frequently subjected, nor have they a good working knowledge of how the material should be handled to the greatest advantage. In these articles Mr. Bogue has aimed to explain the simple principles of glue technology, to the end that glue room procedure may be intelligently and efficiently regulated. Among other points the importance of water proportioning and temperature control is especially emphasized, while the wastefulness of permitting bacterial decomposition and the enormous monetary loss resulting from such practice is demonstrated. Taken all in all, these articles form an interesting, practical and timely treatise on glue room practice. It will be of interest to note that in our next issue Mr. Bogue will commence a further series of articles covering the conditions affecting the adhesion strength of glue and the methods of making adhesion strength tests

*Industrial Fellow of the Mellon Institute of Industrial Research and Research Chemist for Armour & Co., Chicago.
This article represents a part of the section of the "Glue as an Adhesive" in the writer's forthcoming treatise on "The Chemistry and Technology of Gelatin and Glue," to be published by the McGraw Hill Company of New York in the Summer of 1922.

has suffered a chemical change in its constitution. That change is an hydrolysis, slightly different in the nature of the cleavage products produced from hydrolysis by water, acids, alkalies, or enzymes, but nevertheless an hydrolysis, or a breaking down of the gelatin molecule. This decomposition results in an alteration in the properties of the material. The viscosity, the jelly consistency, the joint strength obtainable, are all greatly reduced. Futhermore, the action of the bacteria does not stop upon the application of the glue to the joint, but continues even after drying out. This means that a failure of the joint is very apt to result sooner or later. It makes no difference whether a high grade or a low grade product is used at the start, the contamination with the decomposing material will in a few hours reduce it to a low grade, and reduction in strength will continue in the joint.

Decomposition is a Serious Matter

The loss in dollars resulting from such practice is unquestionably enormous, not to mention the harm done to the house by an injured reputation due to failures in their glue work. Just as in the case of prolonged heating, a high grade glue may be bought, but by the time it is actually put into service it may have been reduced to a very low grade. But while the heating loss ceases as soon as the glue is applied, this is not the case with the decomposed glue, and the latter may, therefore, be productive of even more serious loss than the overheated material. This fact is certainly indicated, if not proved, by the experiments of the United States Forest Service previously referred to. They found that the loss in strength and viscosity sustained by maintaining glues at 104 degrees F. for a number of hours was actually greater than that sustained by maintaining them at 140 degrees for the same period. At the latter temperature the bacteria are inhibited, if not killed, so that the loss in strength observed is due entirely to ordinary water hydrolysis. But at 104 degrees the bacteria are very nearly at their optimum temperature for activity. The water hydrolysis is unquestionably greater at the higher temperature, so the greater loss in strength and viscosity at 104 degrees is due directly to the decomposing action of the bacteria, and to nothing else.

Thorough Cleanliness is Cure for Bacterial Activity

The cure for this disastrous activity of bacteria is very simply to keep the glue pots, kettles, brushes, and all other articles that come in contact with the liquid glue, thoroughly clean. There is no remedy that may be applied to a decomposed glue to again bring it into a sweet condition, and all glue that has become sour should be discarded at once and without regret. Attempting to use it up will bring even greater loss than the price of the glue thrown out. The glue pots and kettles should be drained into a clean container each night, and should be thoroughly cleaned before used the next day. The brushes, stirrers, thermometers, hydrometers, and other implements should likewise be well cleaned. The work benches and floors should be scraped free of all glue that has accumulated on them during the day. By following these simple precautions bacteria will be unable to gain sufficient headway at any time to damage the glue, while the general appearance and odor of the glue room, and the health and morale of the workmen will make such an alteration in glue room technique a decidedly worth-while undertaking.

One further point in this connection. Glue is exceedingly sensitive to the moisture conditions in which it is stored. Occasionally glue will be stored in damp cellars where a considerable absorption of water will take place in the glue. Under such conditions it may happen that a sufficient amount of water may be taken up to enable bacteria, molds, or other micro-organisms to attack the material. Molds especially grow under such conditions, and good glue may be completely spoiled by the decomposition effected by them. On melting these glues the viscosity will be low, the odor will be strong and sour, and joints made by their use will be weak. An excessively dry atmosphere is not to be recommended as the glues become brittle but it is to be preferred to the damp conditions of storage.

Overcoming Public Prejudice Against Veneer

Play up the Word "Plywood" Instead of "Veneer" —Create Interest by Educational Work

Public prejudice against veneered products caused by a lack of appreciation of the significance of the term "veneer," is an important factor in hindering the sale and use of veneered goods, in the opinion of Geo. N. Lamb, secretary of the American Walnut Manufacturers' Association. Addressing the National Veneer and Panel Manufacturers' Association at their Chicago meeting last month he had this to say in urging an educational campaign directed towards developing public confidence in veneer and veneered products:

As I see your problem it is comparatively simple. You want to sell more veneers and plywood. To do so you must create consumer demand rather in your case, or overcome consumer resistance. According to the dictionary and to the belief of most people the word "veneer" means something shoddy, make-believe, or a process to cover up something inferior. At the "Better Homes Exposition" I have come in personal contract with thousands of furniture owners in various large cities and have had the painful knowledge thrust upon me that the word "veneer" is hopelessly "in bad" with the public. We know it isn't true, we know that veneers have a most worthy place in wood construction, and that plywood, both structurally and artistically, is a superior article. What you know and what the public thinks, however, are two distinctly different matters.

Advertise Plywood

Your problem is to put both veneer and plywood where they belong, by educational work. This can be done at a reasonable cost and profitably by education on "plywood," "built up panels" or whatever you decided to call the product. It cannot be done by talking "veneers." The pretty stories of the history of veneers make the veneer man feel good but they won't sell veneers to the public. It will be infinitely easier to sell to the public a new word like "plywood" than it will be to overcome a universal prejudice that exists against "veneers." The word "veneers" is hopelessly dammed and it would take a generation

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

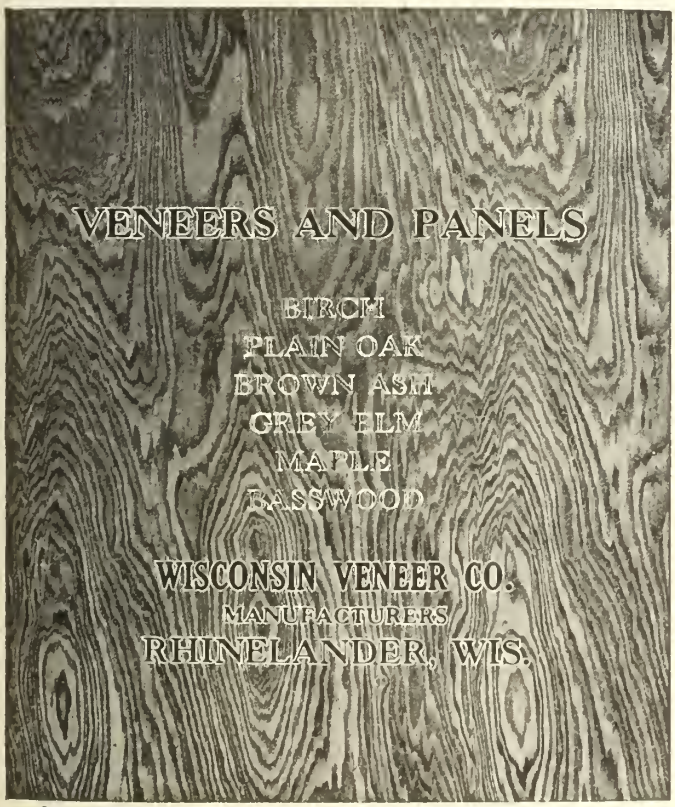
Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.



Litton Veneer Co.

Office and Mill Rockford, Illinois

Manufacturers

American Walnut Veneer and Lumber.

Plain and Figured Veneers of All Kinds.

Grand Rapids Office & Sample Room
192 Monroe Ave.
In charge of HUGH L. CURREN

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.

(When writing mention Canadian Woodworker)

to a full appreciation of its advantages. On the other hand the word "plywood", where it is known, is favorably known. Its development during the war caused a lot of people to hear of it and learn its value. Building on the plywood idea you can sell it to the public, and if plywood goes over then gradually veneers will come again into their own. It is human nature to tell others when you get a new idea. Everyone likes to pass on timely bits of real information.

Public is Prejudiced

This trait can be utilized to sell the public on "plywood." The same trait makes the well established resistance to "veneers" positively hopeless. As a concrete example—I have shown fine walnut room paneling and literally talked it to thousands. The first expression is usually "My! isn't that beautiful? I always did like walnut." The next expression is usually an interrogation. "Is it solid or only veneered? At first I answered "yes" and enthusiasm cooled and the visitor passed on. After various experiments I found that I could not hold their interest by explaining that the panels were built up plywood. I explained the core, the crossbanding and the figured face. I briefly pointed out the superiority of these panels and the word "veneer" finally was dropped entirely from my vocabulary— it would not do. It raised a mental wall to the acceptance of my message.

New Life for the Veneer Manufacturer

The Merger of the National Veneer and Panel Manufacturers' Association and the Plywood Manufacturers' Association will have Important Effect on the Future of the Thin Lumber Industry

The final ratification of the merger of the National Veneer & Panel Manufacturers' Association and the Plywood Manufacturers' Association was accomplished at a meeting held in Chicago on June 21st and 22nd, at which the new scheme of co-operation was thoroughly discussed and plans were outlined for the future welfare of the new organization. The April issue of the "Canadian Woodworker," referred to this all-important move among the thin lumber manufacturers and briefly indicated the scope and policy of the combined organization. It was pointed out that the intention of the organizers of the merger was to

H. Brooke Sale, the president of the National Veneer and Panel Manufacturers' Assn.

maintain the individual identities of the various interests involved in the veneer and plywood industry, grouping them together, however, into one strong powerful association which could handle matters of common interest. Provision is made for subdivision into groups according to the various kinds of wood involved, methods or other desired basis of manufacture, each group electing its own chairman who automatically becomes vice-president of the parent body.

A considerable part of the joint meeting in Chicago was devoted to an explanation of the new scheme, Commissioner M. Wulpi reviewing the conditions that had brought about the merger of the two associations, and outlining the plans on which the work was to be conducted. He made a report of the membership in the three classes as fixed by the by-laws, viz., manufacturers, jobbers and supply manufacturers, stating that 88 plants were on the role. Mr. Wulpi reported that the complete amalgamation of the associations had been consummated, the machinery of the new organization had been set up, and everything was in readiness for a display of new life and vigor.

The delegates were thoroughly convinced of the possibilities of the new organization after hearing the very effective address of the president, H. Brooke Sale, whose message was replete with optimism regarding the National Veneer and Panel Manufacturers' Association under the new scheme of organization. Speaking first of conditions in the plywood and thin lumber industry, Mr. Sale said:—

"It is not my intention to bore you with a lot of my ideas of what is going to happen in business, for with Babson, Brookmire, and Hoover gathering statistics and disseminating it, the first two, I imagine, at an enormous financial benefit for themselves, it would be rather presumptuous, in my opinion, for a business man who does not maintain a statistical department to attempt to advise you as to what is going to happen in the future.

"However, by deduction, we all must feel that we are on the verge of a long, strong prosperous period, not one such as we experienced in 1919 and the early part of 1920, but a logical, healthful prosperity. Those who have prepared during the period of physical, financial and moral reconstruction for what is to come, those who have fortified themselves with every available method of economy, will fare best, and be prepared for the final reaction to depreciation which will inevitably come when the point of saturation is reached. . . ."

Scheme of Organization is Logical

Mr. Sale then proceeded to allay the fears of those who were inclined to be dissatisfied with the merger. "Personally," he said, "I am thoroughly of the opinion that we are on the right track, and those who think

(Continued on page 88)

NICKEY BROTHERS INC
LUMBER VENEERS
NB
NONE BETTER
MEMPHIS
TENN.
U.S.A.

N.B. Quartered Oak
always dependable where exceptional
appearance is demanded.

NICKEY BROTHERS, INC.

MEMPHIS, TENN.

The Investment Side of N. B. Quality

BRANCH SALES OFFICES:

618 Stewart Building
ROCKFORD, ILLINOIS

214 Professional Building
JAMESTOWN, N. Y.

The most convincing testimony of the quality of N. B. Veneer is the tremendous financial investment represented by our plant and its equipment.

Our product must of necessity be worthily emblematic of the ambitions thus represented. As an example, automatic set works to insure absolute uniformity of thickness, were recently installed at a cost of $9,000.

It is such nicety in the details of manufacture that makes the N. B. Trade-Mark, on every flitch from our factory, an emblem of unquestionable quality.

Concentrate Your Purchases and Save Money

Through Buying

Sliced Figured Red Gum and Rotary Cut Gum Veneer
Sawed and Sliced Ash, Poplar and Gum Grand Piano Rims
Sawed and Sliced Quartered Oak

In Cars with Band Sawed Hardwood Lumber

Carload Buyers get closer prices, save freight on local shipments and eliminate damaged goods

NICKEY BROTHERS, INC.

MEMPHIS, TENNESSEE

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.

HOFFMAN BROS. CO.

ESTABLISHED 1867 INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car 1/20'	Red Oak (log run)
½	Car 1/16'	Red Oak (log run)
½	Car 1/20'	White Oak (log run)
½	Car 1/16'	White Oak (log run)
1	Car 1/28'	Walnut (half round)
25M	1/28'	Poplar Crossbanding
5	Cars 1/8'	Poplar (log run)
2	**Cars 1/8'**	**Poplar (corestock)**

Prices by wire on receipt of your inquiry

HB

Reg. U.S. Pat. Off.

FORT WAYNE, IND.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

The Standard Veneer Co.

Portland, Maine

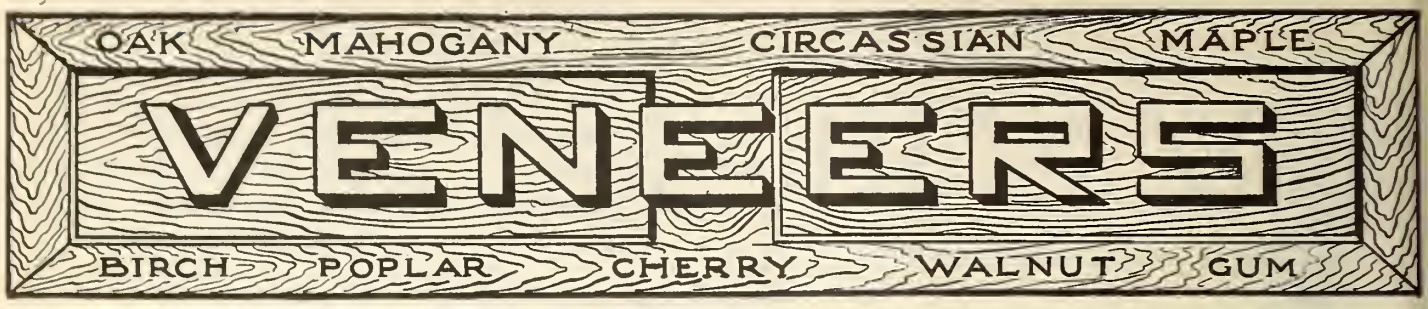
Wide Veneer

One carload of 1/20″ Quartered White Oak Sawed Veneer 12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.

MEMPHIS, TENN.



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

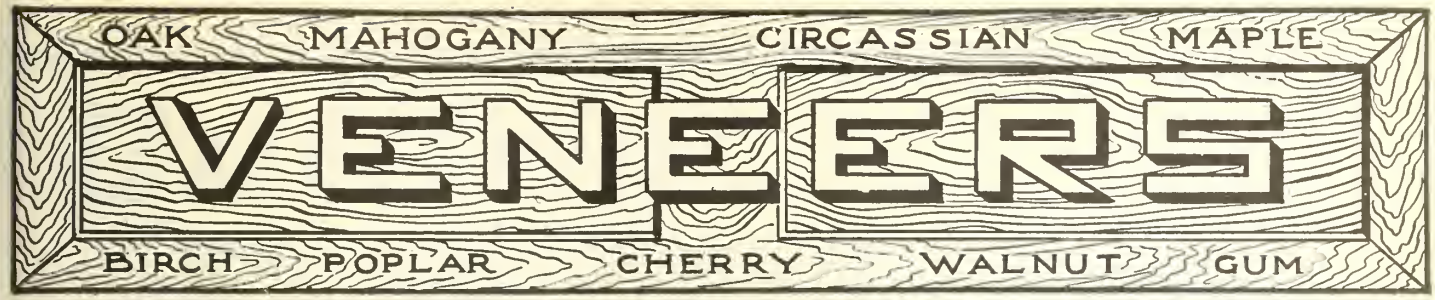
May we know your requirements early?

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.



VENEER MANUFACTURERS COMPANY

Largest Veneer Warehouse in Chicago

VENEERS and PANELS

No Other Veneer Warehouse Affords the Possibilities We Offer—
A Veneer For Every Purpose—Each the Finest of Its Kind

FACE STOCK CORE STOCK CROSSBANDING

Unsurpassed Service ***Right Prices*** ***Fair Terms***

1036 W. 37th. St **Chicago, U. S. A.**

Subscribe for the
Canadian Woodworker
and
Furniture Manufacturer
Only $2.00 per year

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.

"Established 1884"

GUELPH PATENT CASK CO. Ltd.

Scotstown, Que.

QUALITY *SERVICE*

Our Veneers and Plywood are choice and we are fully equipped to supply the Canadian Trade.

Rotary cut Textile dried

We specialize in 1/4" and 3/16" three ply Birch Panels

Ontario Representative:
Frank Moss P. O. Box 356, **Toronto**

Quality Veneers

in

WALNUT BUTTS
MAHOGANY
LONG WALNUT
BURLS · OAK · POPLAR & OTHER WOODS

THE WILLIAMSON VENEER CO.

MILLS - BALTIMORE, MD.

Sales-Branches: NEW YORK (709 SIXTH AVENUE) CHICAGO (28 E JACKSON BOULEVARD) HIGH POINT, N.C., JAMESTOWN, N.Y.

VIEWS OF OUR PLANT No. 11.

H.G.W.Co.

Cutting

PERFECTLY BALANCED AND EQUIPPED VENEER CUTTING PLANT

This Equipment, eliminates waste and guarantees the perfect cutting of our

Superior Veneers

Wood-Mosaic Company

INCORPORATED

LOUISVILLE, KENTUCKY

Representative
H. ROBERTSON
232 Lyon St., N. W.
Grand Rapids

Representative
GEO. W. STONEMAN & CO.
845 W. Erie Street
Chicago

New Life for the Veneer Manufacturers

(Continued from page 82)

to the contrary are wrong in that if they will understand the scope of the groups and the proper functions of the National Veneer and Panel Manufacturers' Association, they will see wherein it is as widely thought out an association as there is in the woodworking industry of to-day. What can be more logical than to bring together the various manufacturers and processes of manufacture for general discussion and sociability, and to organize into groups each of those who consider it to be an advantage to do so, either by process of manufacture, kind of wood or any other method which they collectively might decide upon, and they in turn to discuss with one another, function, and organize properly for such activities as concern their particular group . . . . . It is not the intention of the National Veneer & Panel Manufacturers' Association, so far as is possible, to decide to do anything other than attempt to knit together the various interests into a common interest in such functions as are common to us all, and to subdivide our work separately into those parts of the industry as you may determine for yourselves to be logical and to your advantage."

Importance of Cost Work

Mr. Sale outlined some of the work that the organization would have to interest itself in, pointing out that it had certain functions which it would be possible to carry on with the groups organized under it, which would not be possible of accomplishment by individual groups. He referred particularly to traffic matters, costing, and publicity and trade extension. Very particularly did he emphasize the need for the development of a thoroughly satisfactory costing system for the veneer industries. In this connection his remarks follow:—

"Another very important function, valuable statistics, and methods to which we have fallen heir through the courtesy of the Plywood Association is a logical costing method. They have the machinery set up, and reports made, and a very competent cost engineer for the costing of our industry, and it only remains for the rotary manufacturers, and such other groups as may form and wish to take advantage of this, to have established in their industries an intelligent method of costing at a nominal expense.

"We (meaning those with whom I have been associated in the manufacture of sawed and rotary cut thin lumber) have held the opinion for a great many years that costing could not be accurately determined in the reduction of forest products into lumber and so-called veneer, owing to the fact that it is impossible to accurately determine the value of a log until it is manufactured.

"We had our eyes opened recently through an audit made by the Inventory Auditing Division of the Internal Revenue, stating to us that they had not found it possible to obtain costs in two industries. Now, you will be surprised to know what these industries are. The one is the packing industry, and the other is the forest products industry.

"Regardless of this statement, such industries as Armour, Swift, Cudahy and others who are producing such a large percentage of our food have certainly not gone on all these years without a method of costing as you may well know, but we in our industry, taking it as a whole, have been grossly ignorant of our cost, and even though we should be not able to get a costing system which would be absolutely accurate to the minutest detail, yet it would be far better to know that when a commodity was sold at a certain price it would yield a profit.

"We are grossly neglectful in our industry in not having established a uniform costing system, and the time is not far distant when those who are properly equipped with a costing method will have come to the end of the road, because our vast forests are being surely consumed, and wasted with a prodigality equalled by no other nation in the history of the world. As a whole, our industry is as ignorant of costs as could be possibly conceived, and surely when that time arrives when prosperity will have been considered as past, and we reach the cycle known to the statisticians as "liquidation" which comes just prior to readjustment, then and then only, will those who are properly equipped understand that they have wasted their time and energy and will realize but a small percentage of the book values which they have set up.

"Let us not be like the ostrich and stick our heads in the sand and think that the storm is past, or that we can stick our heads in the sand at any time and let the storm pass, but let us build a properly-constructed storm-proof cost accounting system so that we may not be surprised by an adverse statement at the end of our inventory period and may be able to anticipate our losses, which would otherwise occur."

In conclusion, Mr. Sale urged the members to put their shoulders to the wheel and push the new organization wholeheartedly. "I feel," he said, "that we certainly will have missed an opportunity, yes, even shown our gross ignorance of things that are happening about us, if we do not get wholeheartedly behind the National Veneer and Panel Manufacturers' Association and make a stand in our subdivision of the industry equally as high as any other association in any other business, and I am thoroughly convinced that we are now so connected, through Mr. Wulpi, our commissioner, as to be entered upon a period of association activity such as we have never realized or known."

Publicity Campaign Abandoned

Another important matter which received attention at the meeting was the question of the national publicity campaign, regarding which Commissioner Wulpi made a report. The discussion disclosed the fact that under present conditions it was not thought advisable to continue the effort, and a refund in full of all contributions was ordered. An understanding was reached that as soon as matters opened up the campaign would be re-opened and pushed vigorously.

Interesting addresses were delivered by George N. Lamb, secretary of the American Walnut Manufacturers' Association, and F. F. Fish, secretary of the National Hardwood Manufacturers' Association. The subject of the former gentleman's paper was "Why Manufacturers Organize," while Mr. Fish discussed the question of the merger of the veneer and plywood associations.

It was also reported that the Quartered Oak Manufacturers' Association had voted to join the National Veneer and Panel Manufacturers' Association as a group. Mr. Potter was also installed as cost engineer of the association.

General view of the C. L. Willey Company's Plant in Chicago, showing frontage on the Chicago River. Our facilities for receiving and shipping, both by rail and water, play an important part in the service we render our customers.

Selected logs are arriving at our plant almost daily, sent in from the markets of the world. Our organization is world wide—our outlet practically unlimited. Willey Veneers are found wherever fine work is appreciated.

C. L. WILLEY COMPANY

The Largest Veneer Plant *in the* World

GIVING you exactly what you want, when you want it, insures satisfaction to you and ultimate profit to us.

That is why we maintain a stock and equipment so large and an organization so wide in its operations that you will always find here just what you want, in any kind of Veneer or Hardwood Lumber, backed by a service that has *your* interests at heart. No other kind of service could have built the largest Veneer Plant in the world—no less in service and supply can keep it going and growing, as it is.

Keep us posted on your needs—immediate or prospective—and we will keep you supplied with samples, of the general character required. You will thus avoid shortages, hurry-up orders, and possible delays.

C. L. Willey Company

2558 South Robey Street

CHICAGO, ILLINOIS

W. T. MOORE
Sales Representative for Michigan
110 Pearl St., Grand Rapids, Mich.

W. B. VAN
Eastern Sales Representative
Everett Hotel, Jamestown, N.Y.

(1838)

Will Decorated Furniture Survive?

(Continued from page 76)

containing dry white lead mixed with umber, is dusted over the bright colors then lightly rubbed on the high lights, and the umber and white lead will be retained in the recesses but only partly on the high lights. Many other processes are used. This decoration is mostly adapted to the Italian styles.

Japanese Laquer

So-called Japanese laquer finish is a good enameled, rubbed surface, after which it is striped with gold. Japanese raised designs of trees, bridges and figures are then applied. The designs are first chalked upon this surface. The raising material contains silex, fusil oil, nigrosine and shellac. It is brought to such a consistency that it will barely flow from a small brush and then it is applied to only a portion of the design. It dries quickly and since it contains heating qualities somewhat like lime it melts the enameled surface and securely fastens itself to the wood proper. Therefore, it is non-destructible. Then the artist renders the designed surfaces with generally gold and umber colors, but touches of green, blue, or yellow are also used. The final antiquing is but little known. A coat of laquer containing asphaltum is coated over the striped and decorated surfaces, which having a tobacco brownish cast, gives the gold and other colors a subdued, old effect such as is employed by old English laquer workers. Imitators applying flat bright colors have spoiled this fine art. Only the finer work will endure. Decoration so gaudy that it clashes or detracts from the outlines of the furniture is unlivable and will not survive. Embellishing surfaces with properly designed and colored designs is an art and will not become common.

Group and Individual Electric Drive

The question of which is the most economical and efficient method of transmitting power from the prime mover to the machine is still one which has many reasonable arguments for each system of transmission. It is one which has to be studied from its many sides before an intelligent decision can be made as to what is best suited to the needs of any particular plant.

The three systems in use at the present time are: (1) The long line to which the machines are belted and which in turn is driven by the prime mover; (2) individual motor drive; (3) group electric drive, in which several machines are belted to a short shaft, which in turn is belted to a motor. The long line shaft extending lengthwise through the factory is the time-honoured method of distributing power throughout a woodworking plant. This system is still in use and probably will continue to be used for a good many years.

Individual and group electric drive, however, have come into extensive use in late years and have proved so satisfactory that it has been and is still a common sight to see light-shaft drives being replaced with motor drive, but rare indeed to see a new installation of line shafting in a modern woodworking factory. For the purposes of the ordinary shop or factory, the choice of drive now lies between the individual motor and the group system of driving. Often an engineer can employ both to good advantage, the group system being used for the bulk of the smaller machines, where these are not provided with built-in motors, and individual motors being used on the larger machines, such as those requiring 10 h.p. or more. In planning machine drives one should be governed largely by such considerations as economy of power and maintenance cost, efficiency of the system, depreciation, flexibility as to location of machines, provision for extension and sectional operation, as well as first cost.

Do Not Over Heat Glue

It is important to note that animal or hide glue loses its strength very rapidly at temperatures approaching that of boiling water which are those obtained in the ordinary double glue pot. It is asserted by the Forest Products Laboratories of Canada that hide blues being melted and applied should be maintained at a temperature between 140 and 150° (Fah.) and that above that temperature the strength value of the glue is impaired. In view of the fact it is rather appalling to think of the vast amount of glued work prepared in the past with well boiled glue from which has departed the greater part of its tenacity.

Hardwood Flooring Men Have Outing

A very successful reunion of the sales staff of the Seaman, Kent Co., Limited, Toronto, was held on July 7th and 8th at Meaford, Ont. The party left Toronto early in the afternoon and enjoyed a pleasant motor ride to the northern town. Through the kindness of Mr. Kent and the hospitality of the citizens of Meaford there was not a dull moment in the proceedings The morning of July 8th was spent in a thorough inspection of all departments of the plant and a visit to the yards of the company, and at noon the salesmen were joined by the mayor of Meaford and leading representatives of the town at a dinner at the Paul House, which was thoroughly enjoyed. In the afternoon there was a successful bowling tournament on the excellent green, and during the day a number of the salesmen went fishing.

The return home was made by motor on July 9th, and the outing of the Seaman, Kent Co., who are very busy at the present time in all their hardwood flooring plants, was voted one of the best that has ever taken place in the history of this widely-known organization.

Exhibit of Manufacturers' Lumber Co.

At the recent Made-in-Stratford exhibit, which was held under the auspices of the Chamber of Commerce in Stratford, Ont., a splendid exhibit was made by the Manufacturers' Lumber Co. It comprised wood in its rough state, viz., the log dressed lumber, hoops, staves, etc. A. W. Deacon, secretary-manager of Stratford Chamber of Commerce, says it was one of the most attractive booths at the exhibit and reflected great credit on the enterprise and progressiveness of the Manufacturers' Lumber Co., the members of which are: J. A. McFadgen, C. A. McFadgen and G. A. McFadgen. Besides being manufacturers and wholesalers specializing in various lines of Canadian hardwoods, the company makes staves and hoops of all kinds.

TORONTO HARDWOOD LUMBER COMPANY LIMITED

(Formerly Lumber Dept., Toronto Veneer Co. Ltd.)

Head Office:
1100-1104 Queen St. W., TORONTO. Phone Park, 6980
Yard: Atlantic & Hanna Aves. Grand Trunk Ry. Toronto.

Montreal Office:
424 Power Bldg. Phone Main 8725
Saw-mill: Louisville, Ky.

Walnut	White Ash	Birch
Mahogany	Gum	Basswood
Yellow Poplar	Cottonwood	Beech
White Oak	Sycamore	Maple
Red Oak	Cypress	Elm
Chestnut	Yellow Pine	
	Tennessee Red Cedar	

Ample stocks of the above woods yarded in Toronto. Kiln-dried stocks shipped if desired.

Carload shipments made from our Band-mill at Louisville, where our manufacturing and yarding facilities are unexcelled.

If you are not receiving our monthly stock and price lists, please send us your name so that we may place you on our mailing list.

OUR SPECIALTY—INDIANA FORKED-LEAF WHITE OAK.

An unchanging high standard is your assurance of the utmost in Quality and Service when buying

PANELS LIMITED

Southampton - - - - Ontario

TOPS
CASE GOODS
FLUSH VENEER DOORS
3 AND 5 PLY PANELS
3 AND 4 PLY TABLE RIMS
5 PLY RIM BOUND TABLE TOPS

On hand for Immediate Shipment:
Stock Panels in Mahogany, Walnut, Oak, Birch, Etc.,

Sizes	24 x 60	30 x 60
	24 x 72	30 x 72

Selling Agents:

Toronto Veneer Co., Ltd. 1100-1104 Queen St. W. Toronto

Proper Mill Arrangement and Equipment

(Continued from page 68)

type of machinery, with its large investment, were utilized in producing odd work. Unlike the stock plant rapid production is not vitally essential in the odd work factory, but instead, it is of great importance that machines that can be rapidly changed or set up for small runs be used . By using such lighter machinery in the odd plant, the machinery investment is reduced nearly 50 per cent, thereby enabling the operator to reconcile somewhat the machine burden to the comparatively small output in odd work factory.

When should a machine be considered obsolete? If the inventor should stop inventing and the machine builder stop building better machines than we have today and the user of machines would resolve to keep his present machines in good repair, our present equipment would last almost indefinitely. We do not however, desire the inventor nor the machine builder to discontinue their activities and there is not good reason to believe they will, so it is quite probable that a machine which is perfectly up-to-date today will be obsolete in a short time, either on account of a faster machine being placed on the market or that will do the work with less labor or a cheaper class of help. It is imperative that the individual operator be kept in touch with all new developments, not only that he may successfully compete with his competitor, but that he may assist in contributing towards placing the necessities of life—and especially homes—within the grasp of an increasingly greater portion of our citizenship.

The quality of your sanding affects the finish.

Why Does Clear Oak Flooring Cost Less than Clear Oak Lumber?

Clear oak flooring can be purchased for less than the price of clear oak lumber. Bear in mind that clear oak lumber is being spoken of—a better grade than firsts and seconds. F. A. S. will admit small defects not admissable in clear oak flooring or a clear grade of oak lumber.

What is the explanation of this apparent anomaly? How can an industry subsist that apparently charges less for a completely manufactured article than the raw product from which it is made? An article, too, that requires more men per thousand feet to make than any other article in the dealer's shed.

The fact that oak flooring is accepted in lengths of one foot and up makes possible the manufacture from common oak lumber. It is lengths that give the oak flooring fellow the right to live. And yet how often has the builder contested this reasonable plea for existance by specifying long lengths of oak flooring. The manufacturer does marveously well to give the lengths he does. He must get clear oak flooring out of common lumber and in the cutting necessary to produce it. Long lengths are not possible.

It may be safely predicated that as the years pass, lengths of oak flooring will become shorter than they are today. The supply or large timber is diminishing. A less percentage of uppers is produced and with this a sharper inspection of the lower grades.

When you would examine a planed board as to how it is machined, hold it up sideways to the light, just a trifle below the level of your eyes. You will then readily see all the imperfections.

This photograph was taken of our exhibit at the Indianapolis Industrial Exposition held in Indianapolis last fall, which was attended by more than 150,000 people. Our exhibit was pronounced the finest display of Hardwoods and Veneers at the exposition.

WE HAVE THE FOLLOWING VENEERS READY FOR IMMEDIATE SHIPMENT:

1-20" Qt. Sawed White Oak
1-16" Qt. Sawed White Oak
1-8" Plain Sawed Red Oak
1-8" Cherry
1-8" Walnut
1-28" Walnut Sliced

2,000,000 Feet of Indiana Hardwood Lumber

F. M. Bachman Co., Indianapolis, Ind.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

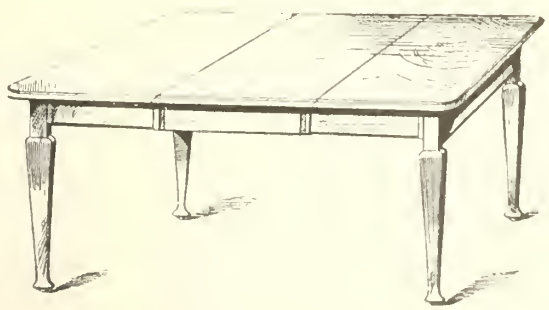
LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

PROMPT delivery in any quantity at very attractive prices. Just let us know your requirements and we shall be glad to forward quotations.

Panels are made in Walnut, Quarter Oak, Birch, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.



HAY & CO., Limited Woodstock, Ont.

Left: Winding yarns from skeins to bobbins.
Above: Finishing off tapestry

Tapestry as a Furniture Covering

(Continued from page 70)

skill and diligence and also covers a separate branch in the textile industry, the workers being known as twisters. To keep the looms going, ammunition in the form of yarn from the shuttles must be constantly supplied. They are wound on spools or bobbins, usually by girls, on special spooling and winding frames.

In spite of the fact that the personal touch of the weavers is not as emphatic in the present state of manufacturing as it was in the days of old, the individual expression is still being created and is of inestimable value toward further progress of the industry.

The illustrations accompanying this article give an idea of some of the operations involved in the weaving of tapestry, such as is used for upholstering purposes. As stated above, they are reproduced through the courtesy of the La France Textile Co., whose plant is located in one of the great tapestry centres of the world and which boasts of craftsmen to whom fine tapestry weaving is a true art rather than a profession.

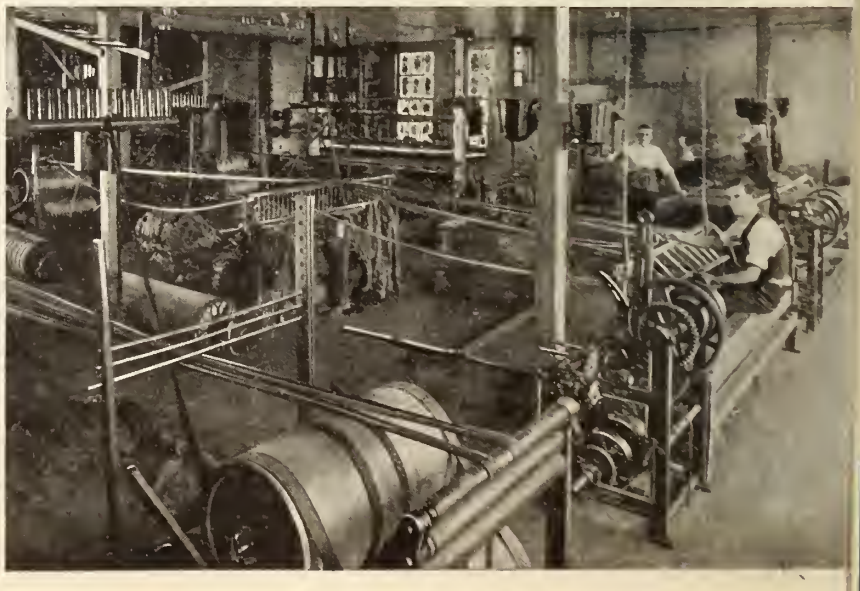
What Is Your Reputation Worth?

S. Karpen & Brothers Find That Integrity and Reputation of Manufacturer Biggest Factor in Selling Upholstered Furniture—Dealer Forced to Rely upon Honesty of Producer

Through a mechanical error a portion of the article in the May "Canadian Woodworker" bearing the above title was omitted from the magazine as printed although included in the proofs. Inasmuch at it offers a timely suggestion to the manufacturer of upholstered furniture the entire article is re-published including the portion previously omitted—Editor]

In no class of furniture does more depend upon honest and thorough factory methods than in the making of upholstered furniture. The integrity of the manufacturer is a big and commanding element.

So much of the quality of upholstered furniture depends upon factors that are not visible to an outward inspection, that this dependence upon the manufacturer looms larger and larger upon deeper considerations. Beneath the covers of upholstered furniture there must be an honest construction all the way through.. Otherwise, no matter what may be



Above: Cloth examining. Right: Long threads of yarns laid out in colors and beamed for weaving

Suggestions of Live Current Items

The usual famous Anderson-Tully service stands behind every foot of the following list of specials which we are pleased to offer the buying trade:

QUARTERED WHITE OAK

4/4 FAS 150,000

Full product of the log in this grade. Stock containing all of the 10" and wider produced, average 7½" for width, 45% to 55% 14' and 16' lengths.

4/4 No. 1 Com. & Selects .....150,000'

Full product of the log in this grade. 45% to 55% 14' and 16' lengths. Stock 8 to 12 months dry.

QUARTERED SYCAMORE

6/4 No. 1 Com. & Bet ..... 75,000'
5/4 No. 1 Com. & Bet. ..... 40,000'

Sycamore is beautifully figured stock, band sawn and equalized, 7 to 8 months dry. 55% to 60% 14' and 16' lengths. All wide in this stock.

LOCUST

4/4 Log Run .....One Car

SOUTHERN SOFT MAPLE

5/4 Log Run .....100,000'
(Worm holes no defects)
10/4 Log Run .....100,000'
(Worm holes no defects)

PLAIN RED OAK

5/4 Common & Select .....60,000'

PLAIN SAP GUM

5/8 FAS .....150,000'

PLAIN SYCAMORE

5/8 No. 2 Com. & Bet.....100,000'
6/4 No. 1 Com. & Bet. ..... 100,000'

Both items running 60% long lengths. Band sawn and equalized and 7 to 8 months dry.

HACKBERRY

5/4 No. 1 Com. & Bet. ..... 150,000'

Band sawn, thoroughly dry, and high grade in every particular.

HICKORY

8/4 No. 2 Com. & Bet. ..... 200,000'
6/4 No. 2 Com. & Bet. ..... 100,000'
10/4 No. 2 Com. & Bet. ..... 20,000'
12/4 No. 2 Com. & Bet. ..... 30,000'

WILLOW

We make a specialty of Willow in 4/4 to 8/4 thickness, and have a stock of this wood. We particularly want to move

4/4 No. 1 Common ..... 200,000'
5/4 FAS. ..... 40,000'
6/4 No. 1 Com. & Bet. ..... 100,000'
8/4 No. 1 Com. & Bet. ..... 50,000'

All of this stock thoroughly dry.

Discriminating buyers will find that it pays to be linked with an organization and service so truly founded on an understanding not only of the manufacture of lumber, but of its proper merchandizing and utilization.

ALL STOCK SIX MONTHS AND BETTER DRY

ANDERSON-TULLY COMPANY

MEMPHIS, TENNESSEE

ATCo (MEMPHIS) HARDWOOD LUMBER & VENEER

the attraction of outward appearance, the davenport or chair will not be satisfactory in use and service.

Value Lies in Honest Construction

A trip through the mammoth departments devoted to the manufacture of upholstered furniture at the great factories of S. Karpen & Brothers is a demonstration in the right kind of factory methods that produce that Karpen quality which stands for so much in the furniture industry. Observation of operations in these departments emphasizes the statement that the value of upholstered furniture lies in its honest construction in every part. Expert workers are seen busy at their particular tasks and the constant and exhaustive inspections of every operation makes perfection absolutely sure.

Somehow, there appears to be an especially noticeable degree of craftsmanship and pride in work among the men and women in these departments. It seems that these workers realize the importance of their work and their work gains that indescribable quality that comes only from true appreciation of the importance of good craftsmanship.

One pauses in the department where the frames are constructed, his attention held by the precision with which the work is done. A sturdy, strong and inflexible frame is the foundation of the davenport or chair and without a perfect frame all the embellishments would be lost effort. The frame must be right, there can be no compromise of any kind.

Every Detail Must be Considered

The value of an upholstered davenport or chair lies largely in the way the springs are put in and the manner in which the materials that make it soft and comfortable are placed in position. At first glance one judges an upholstered chair or davenport by its appearance, but the final judgment of its worth comes only after one has sat down in it and measured its comfort. This comfort, and how long the piece will possess this comfort are determined in the departments where the springs are put into place and where the materials used for cushions are fitted into their place.

Of course, right at the bottom of these two essentials lies the choice of the right materials. Good workmanship cannot redeem poor materials in the manufacture of upholstered furniture. The choice of materials in the Karpen factories, as plainly demonstrated by the materials themselves as they are seen in the workrooms and also by the test of service and satisfaction in the use of the finished products, gives the workers full opportunity to win the results of their best efforts.

The quality of the covers of upholstered furniture is another deciding factor. The wealth of the looms of the world finds its way to the cutting rooms and the finished products that are found in the progressive retail establishments of the country and in the homes of America show what has been done in the way of producing beautiful furniture. The use of leather for covers demands special treatment. These skins are prepared by hand work with the same care that the master artisans of the great periods of art production devoted to their chosen tasks.

Careful Inspection Ensures Satisfaction

From the building of the sturdy, strong frame, through the many important operations that carry the chair or davenport to the final touches that makes it ready for inspection, a high standard of craftsmanship rules on every hand. Nothing "just gets by" for every operation must be finally good and right and proper. Each rigid inspection in every department makes sure of that.

The finished article is scrutinized with zealous attention. Nothing can escape the vigilance of such an inspection. The previous inspections send the article along perfect from step to step in the process of manufacture, but the final inspection is really an "inspection of inspections" for before the finished article goes to the packing room, it must stand up in every way under the closest possible inspection.

The trip through the factory is one which strengthens the conviction that the furniture industry is rich in notable institutions that rank high in the commonwealth of production. Furniture helps make the American homes what they are and it is a matter of great gratification to have a tangible demonstration of the integrity of its manufacture in so vivid a manner as a trip through a great factory where true craftsmanship takes the right materials and produces furniture that serves well and adds to the attractions of American home life.—Furniture Index.

Four Billion Foot Saving Through Use of Small Dimension Stock

Continued progress is being made by the Forest Products Laboratory on its survey of the small dimension stock using industries. As the work progresses it becomes more and more evident that much wood material now being used only for fuel or often disposed of as waste is suitable for the small dimension stock of clear quality required by many of the secondary wood using industries. It is also becoming more and more evident that these latter industries can make much greater and profitable use of ready cut small stock than they now do.

The survey by the Forest Products Laboratory has been under way since May, 1921, and the present work is being confined to the chair and wood turning industries. Besides the data being collected by Laboratory crews through intensive studies at chair factories throughout the United States, statistics on requirements on the entire chair industry are also being gathered by other means. Letters were sent out several months ago to all chair manufacturers with the request that they furnish the Laboratory, on forms provided for that purpose, a list of all sizes of small, rough stock required in their chair manufacturing operations. These requests are receiving a hearty response from the chair industry. Through continued co-operation on the part of the chair manufacturers, it is going to be possible for the Laboratory to compile a very complete list of requirements as to size and species of small stock of the entire chair industry.

One of the objections offered by manufacturing plants against the production of small dimension stock, except possibly on special order, has been their inability to locate information on the exact sizes and species of stock required by the various industries. It is for exactly this purpose that the above mentioned data are being compiled. This work is not going to stop with this industry but all wood using industries such as wood turning, furniture, implement and vehicle, automobile, etc., are to be covered in the same

TURNER-FARBER-LOVE COMPANY

MANUFACTURERS

HARDWOOD LUMBER AND SLACK COOPERAGE

SUCCESSORS TO

DARNELL-LOVE LUMBER CO LELAND, MISS.
RUSSE & BURGESS, INC. MEMPHIS, TENN.
LELAND STAVE & LUMBER CO. LELAND & CHICAGO

MEMPHIS, TENNESSEE
U.S.A.

NATIONAL HARDWOOD LUMBER ASSOCIATION

NATIONAL LUMBER EXPORTERS ASSOCIATION MEMBER OF

Our Lumber is properly manufactured and graded, band sawn, uniform thickness. We can make prompt shipment of straight or mixed carlots and solicit your inquiries

QUARTERED RED GUM

70,000	5/8	FAS
20,000	3/4	"
60,000	4/4	"
30,000	5/4	"
75,000	6/4	"
90,000	8/4	"
50,000	5/8	No. 1 C&S
100,000	3/4	" "
75,000	4/4	" "
15,000	5/4	" "
75,000	6/4	" "
75,000	8/4	" "

PLAIN RED GUM

15,000	1/2	FAS
25,000	5/8	"
20,000	3/4	"
15,000	4/4	"
90,000	3/8	No. 1 C&S
60,000	1/2	" "
75,000	5/8	" "
100,000	3/4	" "
25,000	4/4	" "
6,000	5/4	" "
50,000	5/8	No. 2 Com.
40,000	3/4	" "

PLAIN SAP GUM

60,000	1/2	FAS
25,000	5/8	"
20,000	3/4	"
15,000	4/4	"
30,000	3/8	No. 1 C&S
20,000	1/2	" "
50,000	5/8	" "
40,000	3/4	" "
30,000	4/4	" "
100,000	5/8	No. 2 Com.
120,000	3/4	" "
60,000	4/4	" "
60,000	8/4	" "
60,000	4/4	No. 3 Com.

QUARTERED WHITE OAK

105,000	3/8	FAS
25,000	5/8	"
30,000	1/2	"
50,000	3/4	"
20,000	4/4	"
30,000	3/8	No. 1 C&S
45,000	1/2	" "
95,000	5/8	" "
80,000	3/4	" "
15,000	4/4	" "
80,000	4/4	Strips.
35,000	3/8	No. 2 Com.
50,000	5/8	" "
50,000	3/4	" "

PLAIN WHITE OAK

25,000	5/8	FAS
40,000	1/4	No. 1 C&S
35,000	3/8	" "
60,000	1/2	" "
50,000	5/8	" "
40,000	3/4	" "
30,000	4/4	" "
60,000	1/2	No. 2 Com.
40,000	3/4	" "

PLAIN RED OAK

25,000	3/8	FAS
60,000	1/2	"
75,000	5/8	"
20,000	3/4	"
13,000	4/4	"
14,000	5/4	"
105,000	3/8	No. 1 C&S
16,000	1/2	" "
50,000	5/8	" "
20,000	3/4	" "
24,000	4/4	" "
6,000	5/4	" "
4,000	8/4	" "
105,000	3/8	No. 2 Com.
100,000	1/2	" "
50,000	5/8	" "
100,000	3/4	" "

QUARTERED RED GUM
(Sap no Defect)

100,000	5/8	FAS
80,000	3/4	"
30,000	4/4	"
75,000	5/4	"
30,000	6/4	"
25,000	8/4	"
33,000	10/4	"
25,000	5/8	No. 1 C&S
80,000	3/4	" "
90,000	4/4	" "
15,000	5/4	" "
75,000	6/4	" "
50,000	8/4	" "

ELM

11,000	8/4	Log Run
15,000	8/4	No. 2 Com.
30,000	10/4	" "
20,000	12/4	" "
25,000	5/8	No. 2 & No. 3 Com.
20,000	3/4	No. 2 & No. 3 Com.
17,000	4/4	No. 3 Com.
17,000	8/4	" "
11,000	12/4	" "

ASH

50,000	1/2	FAS
30,000	4/4	"
17,000	12/4	"
16,000	4/4	No. 1 C&S
17,000	8/4	" "
10,000	10/4	" "
15,000	12/4	" "

PANTHERBURN CYPRESS

15,000	4/4	FAS
75,000	5/4	" 4 to 12"
30,000	6/4	" " "
25,000	10/4	" " "
30,000	12/4	" " "
60,000	4/4	" 13 to 17"
40,000	5/4	" " "
30,000	4/4	" 18-up
30,000	5/4	2 "
75,000	4/4	Selects
75,000	5/4	"
45,000	6/4	"
13,000	12/4	"
45,000	4/4	Shop
15,000	5/4	"
15,000	8/4	"
45,000	5/4	No. 1 Com.
200,000	4/4	No. 2 Com.
60,000	5/4	" "
30,000	6/4	" "
15,000	8/4	" "
150,000	4/4	Boxing
60,000	6/4	"
100,000	4/4	Pecky
40,000	4/4 x 8	Pecky
60,000	4/4 x 12	Pecky

MISCELLANEOUS

16,000	6/4	No. 1 C&S Hickory
16,500	6/4	No. 2 Com. Hickory
30,000	6/4	No. 3 Com. Hickory
20,000	4/4	No. 1 C&B Blk. Gum 18
20,000	4/4	No. 2 C&B Qtd. Blk. Gum
15,000	4/4	No. 2A & No. 2B Poplar.
15,000	4/4	No. 1 C&S Cotton Wood

CYPRESS SHINGLES

46,500	4"	Best
211,750	5"	"
93,000	6"	"
225,000	4"	Prime
357,000	5"	"
179,000	6"	"
150,000	4"	Economy
250,000	5"	"
100,000	6"	"

We also solicit your inquiries on Hardwoods, Cypress, Cypress Lath and Shingles. We have a good assortment and suggest that you buy now for your Spring requirements. We can ship mixed cars in thicknesses from 3/8 to 12/4"

Sole Manufacturers PANTHER BURN Cypress

way. When finally completed, information will be available on the requirements of all the secondary wood using industries.

At first glance it may appear that this information will consist of a mass of sizes so complicated and detailed that they will be of no practical use. This will not be the case, however, for from results so far obtained, it has been found there will be a very great overlapping of sizes and species required by the various industries. Thus, a very special size required, for instance by the chair industry in oak or maple may be a standard size used in large quantities by the automobile industry, the case goods producers, or the toy manufacturers. It will be this feature that will simplify the apparent complexity of the requirements of the secondary industries and hence will put the entire scheme on a practicable and usable basis, not only for the consumer of small dimension stock but also for the manufacture of such stock. Incidentally, the commercial application of the results of this product should save annually 4 to 5 billion feet of our diminishing timber resources.

Standardization of Lumber Grades

Grade Rules, as They Exist, Are Not the Result of Scientific Study, nor is There Any Scientific Adaptation of Grades to Consumption Needs — Official and Unprejudiced Inspection Is Needed

By Landon C. Bell*

U. S. Secretary of Commerce, Hoover, in giving the lumber industry the vision of a standardization of nomenclature, grades, and guarantees, and of the benefits to accrue from an agency for the administration, nationally and internationally, of an inspection service embracing all woods, has rendered it a service of inestimable value.

The accomplishment of a system of standard names, standard rules for the grading and inspection of lumber, and the adoption of effective means, such as grade-marking the lumber, car cards, showing quantity and quality of the lumber, and other means for assuring the integrity of grades and quantity, and to prevent grade manipulation, would mark an epoch in the industry. If in addition, an independent, impartial agency, national in scope, undertook to supply everyone who desired it an inspection service at a reasonable cost, the industry would be approaching a plane of great improvement, and undoubtedly would command the public confidence in a way that has been lacking in the past.

Especially noticeable would be the improvement in respect to the hardwood industry, where because of the great variety of woods and consequently the multiplicity of grades, clarification and standardization is greatly needed; furthermore the internal dissensions regarding the control of inspection service has been such as to create doubt in the public mind as to the adequacy and integrity of the instrumentalities heretofore controlling the service. Certainly the refusal of the service, except to members of the association supplying it, has been wrong and is indefensible.

Grade rules as they exist at the time Mr. Hoover makes his suggestions are certainly not, at least in the hardwood industry, conducive to the most perfect utilization of the lumber. The best informed thought, practical and technical, is practically unanimous in the view that the rules are of more or less haphazard growth, and are not the result either of scientific study or scientific formulation. They are not such as to scientifically conform production to consumption requirements.

It is the effort of the standardization movement to make the necessary analysis of the production possibilities from the woods, likewise the necessary analysis of the consumption requirements of the products, and thereupon to scientifically formulate and define the rules in such way as to allocate the available supply to the consuming industries in proportion to their needs and demands so that the products of the manufacturers may be utilized with the least waste and therefore at the lowest cost to the ultimate consumer.

The lack of scientific adaptation of grades to consumption needs often results in the consumers being burdened with a large amount of by-product or so-called waste material, for which he really has no use, but for which he must find one, or else the material becomes a total loss in his hands. Capable authorities estimate that the amount of such waste can, by the perfection of the standardizations proposed, be reduced many per cent—estimates ranging variously from 60 to 70 per cent.

The universal approval among consumers of the proposals of the Secretary of Commerce is indicated by the following paragraph from a publication serving the wood-working industry, in which it was said:

"The woes of the wood-worker have been largely due to a plethora of patterns, defective nomenclature, confusion in grades, etc. With his usual foresight and energy, Secretary Hoover has singled out this weak spot in the trade and begun remedial measures. The four-day preliminary conference of American lumbermen which he called reflects a unanimous opinion which will undoubtedly result in much standardization, in definite nomenclature, universal grades, markings and practices. It looks as though a national system of inspection and certification would be established, to embrace the entire lumber trade, that descriptions of different species of lumber will be made as uniform as possible, that inspection service will be open to consumers in settlement of all disputes, and that this system will be extended to foreign consumers. It will certainly be a great satisfaction to the consuming trade when all sources of supply are governed by uniform rules and standardized grades protected by official and unprejudiced inspection.

Such a scientific adaptation of production to consumption requirements and a fuller understanding by consumption of the possibilities of supplying its needs will tend to a more perfect utilization of forest products, and not the least important of the consequences will be the resulting conservation of our timber resources.

*Chairman, Press and Publicity Committee, Hardwood Manufacturers' Institute.

Uniform Lumber Means Greatest Satisfaction To The User!

You no doubt have experienced the expense, loss of time, and loss of materials, caused by the use of improperly cured, wrongly graded, and carelessly handled hardwood.

Kraetzer-Cured Lumber is absolutely uniform in quality, properly graded, and every board plainly marked, showing the grade. To show our faith in Kraetzer-Cured products, every board is stamped with our brand.

THE KRAETZER-CURED LUMBER CO.

Because of our unusual facilities we control the lumber from the virgin growth to the time it is loaded on the cars and shipped to you.

When you have once used Kraetzer-Cured Lumber you will not be satisfied with the ordinary kind. Read the eight important reasons why Kraetzer-Cured Gum is used by thousands with such satisfactory results. It will give the same results to you.

Kraetzer-Cured Lumber is of the very best quality, carefully handled by all departments. Every step in this process is taken with the idea of producing uniform high grade hardwood that w ill give maximum service in your hands.

In addition to Kraetzer-Cured Gum, we can furnish Oak, Ash and other Southern Hardwoods.

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorehead, Miss. Leflore, Miss.

You Should Use KRAETZER-CURED GUMWOOD *Because:-*

1. It is STRAIGHT and FLAT, free from the warp and twist usually encountered in untreated stock.
2. It is BRIGHT and will satisfactorily take any finish.
3. It is free from dote or rot—the sap and gums are eliminated by the steaming process. and fermentation and decomposition are thus prevented.
4. Through the elimination of stain and decomposition, it possesses greater strength and longer life.
5. It contains only atmospheric moisture, enabling it to be used for many purposes without kiln drying.
6. When kiln drying is necessary, this can be done in much less time and with more satisfactory results.
7. It is uniform and dependable. One car like another, grade and measurement what it should be—no time w a s t e d in reporting complaints or shortages, no delays or interference with factory schedules because of holding lumber for adjustments.
8. It is the most economical lumber available. It will satisfactorily answer any requirements expected of materially higher priced woods. Join our little army of satisfied users, and just as peace is about to supplant war, let peace of mind take the place of the warfare and worries that usually beset the user of lumber.

We're proud of this product —that's why.

News of the Trade

E. B. Eddy Co. Limited, Hull, Que., are preparing plans for an addition to their match factory to cost about $1,000,000.

Dominion Hammock Mfg. Co., Limited Dunnville, Ont., are building a new factory building at a cost of $50,000

The Board of Education of Renfrew, Ont., is receiving tenders for the construction of a new collegiate at a cost of $200,000. No seating equipment has yet been purchased.

Work is expected to start shortly on the interior trimmings of the new church at St. Maxime De Scott, Que. Rev. E. Bernard is the priest of the parish.

Donald F. Johnston Radio, Ltd., Toronto, were recently incorporated to manufacture all kinds of radio cabinets and other wireless apparatus.

The consolidated School, Queenston Rd., St. Catharines, Ont., is receiving tenders for alterations and additions to the present building. J. Newhouse is one of the trustees.

Walter G. Woolley, 231 Indian Grove, Toronto, a cabinet finisher with the Brunswick Phonograph Company, recently passed away in his 41st year.

Spruce Falls Investments, Ltd., Kapuskasing, Ont., have been granted a provincial charter to operate planing mills and manufacture and deal in wood products. Capital $40,000.

Wm. Rutherford & Sons, Limited Ottawa, Ont., recently secured the millwork contract for the new Fairmount Presbyterian Church, at Montreal.

Doon Twines, Kitchener, Ont., manufacturers of factory twine, are calling for tenders for the erection of an addition to their factory to cost about $35,000.

IXL Manufacturing Co., Palmerston, Ont., battery makers, recently suffered a fire loss of $15,000. The company contemplate rebuilding in the near future.

Radiola Company, of Canada, Limited, Ottawa, Ont., were recently granted a federal charter with a capital of $100,000 to manufacture and deal in radio equipment.

W. F. Vilas Co. Ltd., Cowansville, Que., manufacturers of school and office furniture, report business as good with them, factory running day and night.

Sturgis Baby Carriage Co., Sumach St., Toronto, are contemplating building a two-storey brick factory at Brampton, Ont.

The Canadian Match Co., Pembroke, Ont., are asking for tenders for a new match factory which they contemplate building.

Broomsgrove Guild of Canada, Limited, Montreal, was awarded the contract for the fixtures and interior woodwork for the new cafeteria being erected by Cordner's Limited. Montreal.

The Dowse Sash & Door Co., Limited, St. Boniface, Man., have been given the contract for the woodwork in the new film exchange being erected at Winnipeg at a cost of $170,000.

Quebec Hardwoods, Limited, Montreal, were recently granted a provincial charter to manufacture and market all kinds of forest products. Capital $50,000.

J. Walter & Sons, Kitchener, Ont., manufacturers of wood fibre products, are calling for tenders for a new factory building. The estimated cost is in the neighborhood of $25,000.

The School Board at Hickson, Ont., are building a new school to cost $12,000. Foundations are in and seating equipment will soon be required.

Lyons Bros., Plymouth Ave., Toronto, manufacturers of wood boxes for storage batteries, have installed equipment for making wood separators for batteries.

Robert Stewart, Limited, Guelph, Ont., manufacturers of sash, doors and all kinds of interior trim, are contemplating the erection of a dry kiln as a supplement to their new factory building.

Mr. R. Smith has opened an upholstering, furniture repairing and polishing, and cabinet work business at 29 King St., St. Catharines, Ont., under the name of the Niagara Cabinet Works. He reports business very good.

A new school is being erected in Winnipeg, by the school board, which will cost $79,988. The millwork is being supplied by A. R. McDiarmid Co. Ltd., Brandon. Seating equipment has not yet been purchased.

Frederick Martin, 356 Sumach St., Toronto, for many years connected with the piano manufacturing business, died recently in his 80th year. Deceased was employed at different periods with Jacques & Hay, Nordheimer Company, Heintzman & Co. and Gerard Heintzman.

Messrs Sangster Bros., have opened a sash and door factory at Niagara Falls, Ont., equipped with modern machinery, and although operations were commenced but recently, they report business as very good. The members of the firm have had many years experience in carpentry and joinery in the Old Country.

Made-in-Stratford exhibit at the Canadian National Exhibition have secured 10,000 square feet in area in the West corner of the Coliseum. Among those in the Stratford delegation who visited Toronto to select the location were Messrs. S. J. Cook, F. W. Trebell, H. W. Strudley, F. M. Gifford and Duncan Ferguson.

Arthur Gore, of St. Thomas, Ont., recently invented an apparatus for drying dishes and has applied for patents. The contrivance is made entirely of wood and at present is being hand-made. Mr. Gore is carrying on his little business in a wood shed at the rear of his home and if the drying device is a success the business will be removed to larger quarters where woodworking machines will be employed.

The Hanbury Co., are installing machinery from Sawmill Machinery Co., Hackettstown, N. J., which was purchased through the General Supply Co., of Canada, Winnipeg. The firm will cut their own timber from the Riding Mountains. The Hanbury Co. who manufacture boxes of all kinds, crates, shooks, cross-arms and open sash, have one of the largest plants west of Ontario.

One of the many new pieces of equipment installed in the new woodworking plant of Robert Stewart, Limited, Guelph, Ont., is a machine made by H. B. Smith, of Smithville, N. J., for cutting the zig zag grooves in stair stringers, into which the risers fit. The machine may be used on any kind of wood and is a great help in the manufacture of stairs.

Standard Lumber & Supplies Limited, who were recently granted a charter, are opening a lumber yard at the corner of Giles & Mercer Sts., Windsor, Ont. E. J. Kerby is the secretary and treasurer of the compony. E. Allen, who was for a number of years with Robert Stewart, Limited, of Guelph, is a member of the organization. It is probable that the Standard Lumber & Supplies will later on put up a plant of modern size and carry a full stock of building materials.

The Hanbury Mfg. Co., Limited, of Brandon, Man., who

The Sidman Lumber Curing Process

IN

Remodeled or new, Wood, Brick or **Concrete** Buildings.

Fillers and glazes to preserve the building.

The TAG-ROESCH **Automatic** Time-Temperature and **Humidity Controller.**

Three-ply and Du-o-fold Army Duck Curtains, and Hussey Door Carrier Doors.

Automatic Heating, Ventilating and Humidity Systems for Varnish Rooms.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Sidmans AUTOMATIC **Suction System** for returning ALL Condensation DIRECT to the Boiler.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-Down Draught Vent Heads for all purposes.

Cleanable Screen Panel and Window Ventilators.

Roller Bearing (Ott) **Channel Iron** Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and The Sidman Special Hygrometers.

For Description and prices, write

The

Sidmans of Canada

Heating and Ventilating Engineers and Lumber Curing Specialists

LONDON ONTARIO

THE SIDMAN LOCK Reg Trade Mark

Bone Dry

Canadian Hardwoods

offered for quick sale

2	cars	4/4″ No. 1 C&B Basswood.
3	“	5/4″ No. 2 C&B Basswood.
1	“	8/4″ No. 2 C&B Hard Maple.
2	“	12/4″ No. 1 C&B Hard Maple.
4	“	4/4″ No. 1 C&B Birch.
2	“	8/4″ No. 1 C&B Birch.
2	“	12/4″ No. 1 C&B Birch.
2	“	8/4″ No. 2 C&B Oak.

Stock that will please the hard to please

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 514 Canada Cement Co., Bldg.

Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

are box and shook manufacturers, intend erecting a sawmill near their box plant in Brandon, for cutting their own logs, to be used in their factory in the making of boxes, etc.

The Ball planing Mill Company, of Barrie, Ont., have secured the general contract for repairs to a business block

Kingston Broom Co. Limited, Kingston, Ont., recently suffered a fire loss of $1,000.

Fisher Box Company, Limited, Kingston, Ont., was damaged by fire recently to the extent of $1,000.

J. Noble & Sons, have recently started in the retail lumber line in Whitby, Ont., and are also conducting a general woodworking business.

The Canadian Match Co., Pembroke, Ont., are asking for tenders for an additional factory, which will cost in the neighborhood of $25,000.

Monarch Batteries Company, Kingston, Ont., was damaged to the extent of $7,000 in a recent fire which caused considerable loss to a number of other manufacturing firms in the same building.

on Dunlop St., in that town.

J. H. Lebeuf, Ltd., Lachine, Que., recently secured the millwork contract for the new school at St. Pierre Aux Liens, Que.

The School Board of Timmins, Ont., are asking for tenders for a new four-roomed school. No seating equipment has been purchased.

The City Council of Ottawa, Ont., has purchased a variety saw from Canadian Fairbanks-Morse Co. of Canada, Ltd., along with several other items of machinery and equipment.

E. Laevens, general woodworker, Kamsask, Sask., intends to install in the near future a small mortiser and tenoner outfit for a h.p. engine.

Plans are drawn for the new Central Church of Christ, Patron Rd. and St. Clarens Ave., Toronto. An organ will be purchased and also seating equipment.

Durant Motors of Canada, Ltd., Toronto, are asking for tenders for an addition to their automobile factory at Leaside, Ont., to cost $500,000.

H. H. Clark, of Coaticook, Que., is building a new mill and equipping same with new up-to-date machinery for the manufacture of handles, dowels and turned goods. Water power for running the plant will be supplied by a stream running through the property, connections having been completed recently.

George Robinson, an employee of the Rodney Woodenware Company, while oiling a machine in motion, was cut to pieces when his clothing caught in the wheels. He was sixty years of age and was a former resident of West Lorne, Ont.

A. E. Stanners, who has been for the past twelve years associated with the Seaman, Kent Co., Toronto has been appointed sales manager, succeeding W. T. Cole who recently resigned to enter business for himself. Mr. Stanners was for some time the representative of the firm in Winnipeg, and later in Montreal, and during the past few years has looked after part of Toronto and Ontario. He has entered upon his new duties.

Foundations for a new school which will cost about $60,000 are going in at Edmundston, N. B. The school board has not yet purchased any seating equipment.

The Dominion Fabrics, Limited, Dunnville, Ont., have been granted a provincial charter to manufacture and sell furniture coverings over drapes and other textile goods and fabrics. Capital $250 000.

G. W. Wyckoff, president of A. Wyckoff & Sons Co., Elmira, N. Y., manufacturers of wood water pipe, died recently in Washington, D. C., following an operation. He had many friends in the lumber industry in Canada with whom he had, in years gone by, extensive business relations. Frank H. Horning of Toronto, who was for a number of years associated with the firm, attended the funeral of Mr. Wyckoff.

Jewett Radio-Phonograph, Limited, Windsor, Ont., have leased a factory in Walkerville, Ont., where they will manufacture their combination phonograph and radio machine. E. H. Jewett, one of the heads of the Paige Detroit Motor Car Co., and president of Jewett, Bigelow & Brooks Coal Company, is the leader of the Canadian concern.

Word received from Huntsville, Ont., is to the effect that the Muskoka Wood Mfg. Co., whose flooring plant and sawmill were destroyed by fire a few weeks ago, have purchased a sawmill in Algoma and are having it moved to Huntsville. Some of the equipment has already arrived and workmen are preparing the foundation for construction. The new mill will have cutting capacity of some 40,000 feet a day, and will be in operation about the middle of August. Regarding the re-ercetion of the new flooring factory, no decision has been arrived at, at the present time.

The Industrial Specialty Mfg. Co., of Magog, Que., have lately purchased the sawmill and equipment of O. Langlois whose plant adjoined their own. The Industrial Company are cutting this season about 2,000,000 feet, three-quarters of which is hardwood and the remainder softwood. The company report that their woodworking plant being very busy at present. Spindles, spools, bobbins, shuttles, specialty lines, and hardwood flooring are turned out by the firm, who also do a large wholesale lumber business.

The Separate School Board of Arnprior, Ont., are finishing the interior of their new school. 160 seats are to be purchased. G. O. Devine, Box 132, is secretary.

Gold Medal Radio-Phonograph Corporation, Limited, Uxbridge, Ont., have been incorporated with a capital of $300,000 to manufacture and deal in phonograph and radio cabinets, furniture and other wooden products.

Aquamobile, Limited, Toronto, have been granted a provincial charter to manufacture and market all kinds of wooden boats. Capital $40.000.

Messrs. Fred Holmes & Sons, Toronto, have the contract for installing organ and decorating Shea's Hippodrome, on Terauley St., Toronto.

A new corporation, known as the Beaver Products, has been formed to acquire the Beaver Board Company. They will operate 17 manufacturing plants in Canada. At the present time, the Beaver Products Corporation has issued $3,000,000 first mortgage and refunding, 20-year, 7½ per cent. sinking fund gold bonds.

C. J. Chaplin, supervisor of timber tests at the Forest Products Laboratory, of Canada, McGill University, Montreal, recently announced that after numerous tests, Canadian poplar has been discovered to be suitable for cigar boxes. The imported havana cigars are sold in boxes made of Cuban Cedrela wood. Canadian tobacco manufacturers will be glad to learn that poplar can be treated to resemble the Cuban wood which seems to have gained as much reputation as the different brands of cigars themselves.

W. H. Cushing, of Cushing Bros., sash and door manufacturers, Calgary, states: Building operations in the prairie cities have created an increased demand in the past few months for B. C. lumber. Mr. Cushing, who was Minister of Public Works in the Rutherford government, is president of Cushing Bros. Ltd. "Optimistic views are held about the crop and if they materialize," he said, "the farmers will also enter the market and create a really good demand for B. C. lumber. It is several years since they bought in any quantity and there is a lot of work to be done when the farmers get the money to do it. The West has been having good rains, but a lot more is needed as the ground is dry, but on the whole the outlook is considered good."

QUALITY **SERVICE**

In Canadian Hardwoods

Kind you want

Impressive quality

No better manufactured

No kick

On grades

Now is the time to order a sample car

THE

Kinnon Lumber Co.

LIMITED

145 King St. W. Toronto

New and Used Woodworking Machinery

We Can Save You Money—Look over our partial list and if you do not see your requirements—Write, wire or phone us.

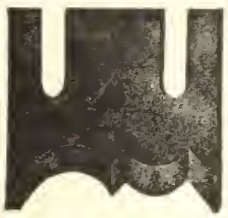
Shaving Exhausters	
50" American Blower Co., 16" Outlet	$ 75.00
48" Foster Ball Bearing 18" Outlet	100.00
36" American Blower Co.	65.00
Moulders	
7" 4 Sided Goldie McCullough	350.00
7" 3 Sided Cowan & Co.	275.00
12" 4 Sided Cowan & Co.	650.00
Shapers	
2 Spindle Clark Demill	150.00
2 Spindle	100.00
1 Spindle	85.00
Sanders	
Pattern Makers 18" Disc and Drum	75.00
No. 131 Mattison Belt, 8' Table	350.00
Planers	
20" Major Harper Ponev Planer	250.00
24" Major Harper Ponev Planer	175.00
30" x 12" McGregor Gourlay Double Surfacer	1250.00
McGregor Gourlay Universal Woodworker	200.00
24" Buzz Planer (No Fence)	100.00
Mortisers	
McGregor Gourlay	100.00
Lathes	
12" Pattern Makers Iron Bed	75.00
Saws	
Trim and Rip Saw	125.00
42" Jackson Cochrane Band Rip	250.00
Elliot Woodworker 1 H.P. Motor	180.00

GENERAL MACHINERY Company

67-69 Frederick St., TORONTO

TELEPHONE MAIN 2200

The Peter Hay Knife Co., Ltd.



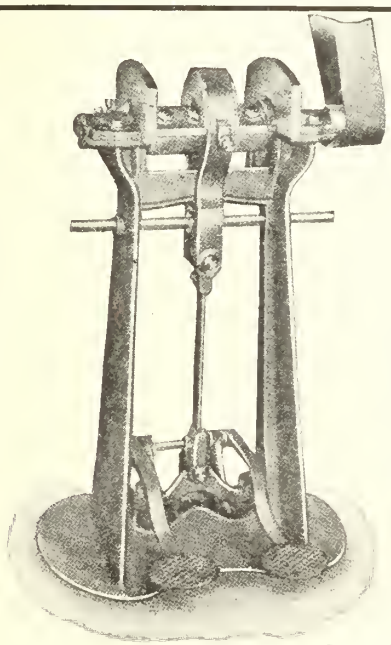
Manufacture the Best

PLANER KNIVES and CUTTERS

OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited

GALT, ONTARIO



Irregular Dresser or Shaper

This machine is designed for dressing all odd or irregular stock to shape.

Especially suitable for box pattern work. Necessary in every mill where body stock is turned out.

WOOD-WORKING MACHINES.

No. 19 Small Saw Tenoner.
No. 20 Large Saw Tenoner.
No. 21 Regular Bevel and Mitre Saw.
No. 22 Large Bevel and Mitre Saw.
No. 23 8½-in. Irregular Dresser
No. 24 6-in. Irregular Dresser Stock Clamps.

Woodworking machines equipped with direct motor or belt drive.

METAL MACHINES

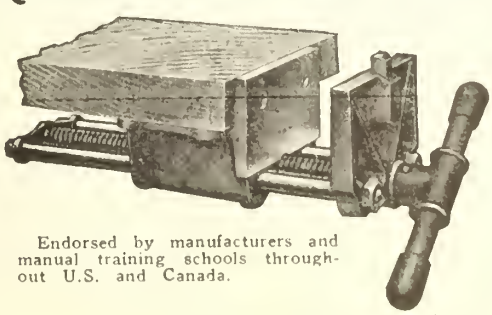
Large Automatic Power Hammers (For body panels and all other metal work.)
Small Automatic Power Hammers (For body panels and all other metal work.)
Metal Trimming Cutters.
Rotary Cutters.
Metal Rollers or Formers.
Power Beaders. Foot Presses.

Write for catalogue

PETTINGELL MACHINE COMPANY

AMESBURY - MASS.

Quick as a Cat - A Hold like a Bull Dog



Endorsed by manufacturers and manual training schools throughout U.S. and Canada.

No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

No. 430 Vise—Two Sizes with or without stop

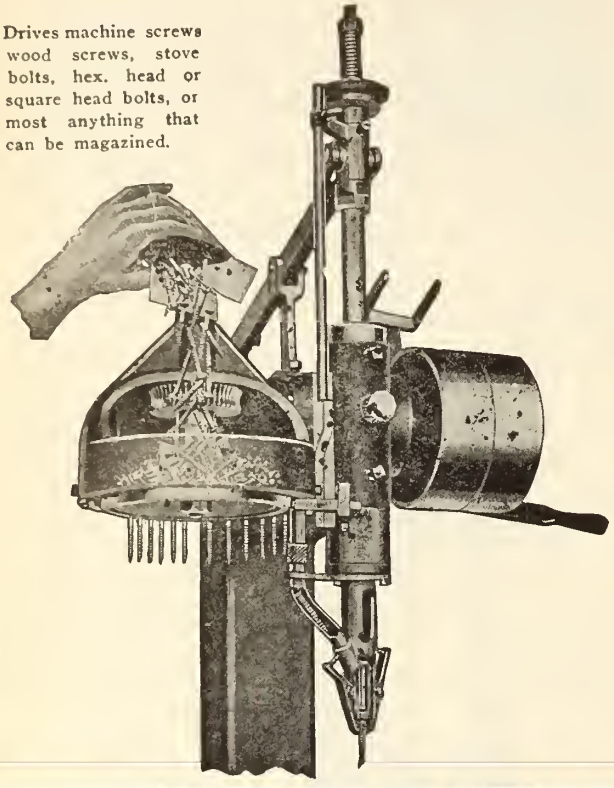
UNEQUALLED FOR STRENGTH AND DURABILITY

Our Complete Catalogue on Request

RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.

The Demand is for Lower Prices!

Drives machine screws wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.



Reynolds Automatic Screw Driving Machinery will help you meet the demand

Everywhere the manufacturer is faced with the problem of price reduction. How can he find the solution?

By cutting out every waste—of time, labor materials, etc.

Many manufacturers have installed Reynolds Screw Driving Machinery for this reason. It accomplishes the work-better in one-third of the time.

Consequently they are able to meet the demand for lower prices and hasten the return to normal buying.

Are you interested? Then write us to-day for the full facts.

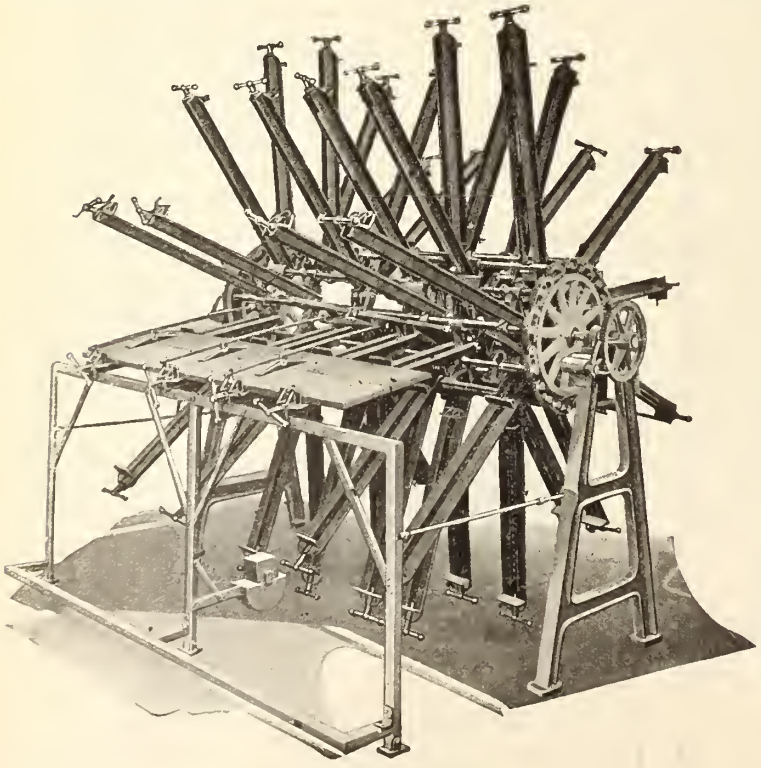
Send us dimensions over all of your work and gauge and length of screws driven so that we can determine the proper size and type machine to meet your requirements.

The Reynolds Machine Co.

Department C.

Massillon, Ohio, U.S.A.

Speed -- Perfect Joints = Low Costs



The Taylor TRADE MARK

CLAMP CARRIER

for

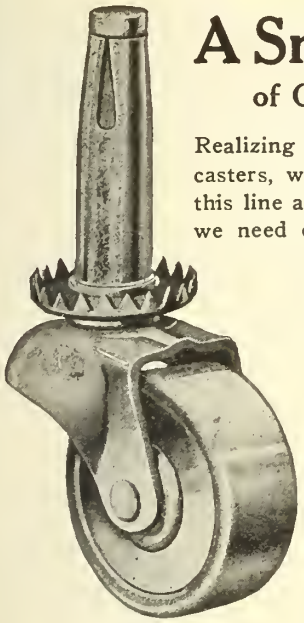
Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.



No. 5

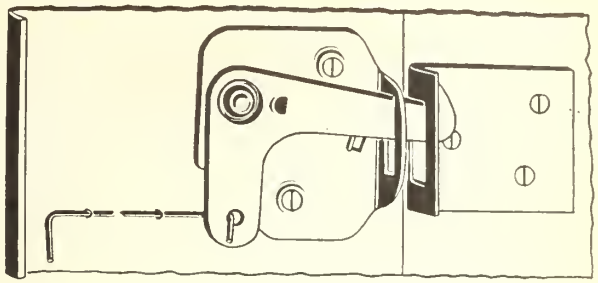
A Small Article
of Great Importance

Realizing the importance of efficient casters, we have made a specialty of this line and as proof of their quality we need only say that many of the foremost furniture manufacturers are using them exclusively.

By the way don't it seem logical that a Canadian-made caster should be the right one to use on Canadian-made furniture? Assuming of course, that it equals the standard of the imported article?

If you believe so too, just write us for samples and prices.

National Hardware Co., Limited
Orillia, Ontario



No. 22 Table Top Lock

No. 9
Mirror Stop

Furniture Trimmings and Special Hardware

We Also solicit your enquiry for Special Stampings

Larsen & Shaw, Limited
Walkerton, Ontario

CLAMP NAILS DO IT

THE CASKET-MAKER

Internationally known and universally adopted by the leading manufacturers of furniture and caskets as the most practical and economical method of mitred joinery.
Samples and circulars on request.

CLAMP NAIL COMPANY
4532 Palmer St. **CHICAGO, U.S.A.**

"The Phillips Line"
Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

Atlas Mfg. Co. of Orlando
Orlando, Fla., U. S. A.

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

USED MACHINERY

For Quick Sale

1—30" Double Surfacer.
1—26" Double Surfacer.
1—24" Double Surfacer.

Above machines equipped with two-knife square cylinders, sectional rolls, flexible chip breakers, countershafts.

Special price for quick sale.

Colladay Machine Works, Manufacturers of Woodworking Machinery, 626 Race St., Philadelphia, Pa. T.f.

Machinery for Sale

One single Tenoning Machine
One Two Spindle Shaper
One Single Spindle Ro ting and Dovetailing
One Universal Sander
One Surface Oak Printing Machine
One Sawmill Carriage and Saw Frame in good condition.
One Electric Motor—35 Horse Power This has only been run one month.
One Electric Motor—50Horse Power This has only been run one month.

All the above are second hand—and as good as new. Ask for particulars. National Table Co. Limited, Owen Sound, Ontario. 6-8

FOR SALE

The Canadian Patent Rights of No. 216987 March, 1922.

A safety Circular Saw Protector which prevents all accidents to users of Circular Saws for lumber cutting, the Saw being entirely covered and invisable during the process of usage. Easily fitted to any bench by three bolts. Gilbert Spiller, Chagford, Devon, England. 7

SALESMAN WANTED

One who has had the experience with high grade panels. Middle West company. Address Box 138 Canadian Woodworker, Toronto, stating age, experience, salary or commission expected. Replies strictly confidential. 7

FOR SALE

One second hand QY McGregor Gourlay 15" four sided planer and matcher, used about one month, as good as new. Apply Box 137, Canadian Woodworker, Toronto, 7

GOOD VALUES

Subject to Prior Sale

Band Resaw, Connell & Dengler, 54 and 60 inch.
Band Rip Saw, Yates No. 281.
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 30" and 44".
Dowel Machine, Clement.
Dowell Gluer and Driver, E. B. Hayes.
Jointer, Falls Machine Co., undercut 24".
Jointers, 12", 16", 24".
Jointer, Diehl Continuous Feed.
Lathe, Back Knife Clement 40 in.
Matcher, American No. 229 hardwood.
Moulder, Hermance 8 and 10 in. 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 7" and 10" 4 side.
Planers, all sizes, single and double.
Sander, endless bed, 48 in. H. B. Smith.
Sander, Moore Machine Co., belt.
Sanders, Berlin 36", 42", 48" and 60".
Sander, Clement Belt roller table.
Saw, mitre double end Maddox.

Woodworking Machinery Co., of Buffalo, 54 Mechanic St., Buffalo, N.Y.

7 T.f.

Wood Cuttings for Sale

Kiln Dried Maple and Oak Cuttings 1" Thick by various widths ¼" to 1¼" Good clear stock. We will machine to size if desired.

THE WHITE SEWING MACHINE COMPANY OF CANADA, Limited. Guelph, Ontario. 7

Some Wood Sinks

Wood floats. That is a fact so familiar as to need no comment. Nevertheless, there are certain woods so dense of structure and therefore so heavy, as to sink in water.

One of them is the "mancono" wood of the Philippines—unknown to us until recently, but which, it is hoped, will serve as a substitute for the costly lignum vitae.

Lignum vitae is the wood of a tree native to the American tropics. Some of the best of it comes from Cuba. Its name, meaning "wood of life," was bestowed upon it by the early Spaniards, among whom a belief arose that it possessed almost miraculous properties as a cure for various diseases.

The best bowling balls are made of lignum vitae; also heads for golf clubs and other things requiring an extremely hard and heavy wood. But the most important use of this material is for the steering gear of ships. The propeller shafts of every warship and commercial steamship revolve in bearings of lignum vitae.

The great strength of this remarkable wood is due to the fact that its fibres are woven back and forth in layers that cross and crisscross. Its cells are filled with resin, which acts as a lubricant and enables it to resist saturation by water. Propeller bearings made of it are almost wearproof.

Lignum vitae weighs 80 pounds to the cubic foot and is therefore, much heavier than water. It will not float. Good logs sell at 52 cents a pound.

Another nonfloating wood is "quebracho," which is only less heavy than lignum vitae. It comes from a tree that grows over vast areas, scattered through the forests in Brazil and other parts of South America.

This wood is so hard that highly tempered tools are needed to work it even when it is young and green. It will soon blunt the keenest axe. Nine railway ties made of it will weigh a ton. It is fine-grained and takes a beautiful polish, the sapwood being nearly white and the heartwood cherry red. In South America it is much used for furniture and interior finish.

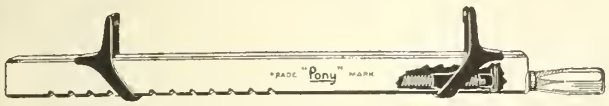
But the greatest value of quebracho lies in the extract obtained from it for tanning high-grade leathers—Service.

With the continued healthy activity in construction throughout the Dominion many lumber wholesalers are finding themselves seriously short of material to supply the demand. Such a situation is not a surprise according to reports from the different producing centres, particularly in the east and many manufacturers who have not been operating for the last two years are now witnessing a demand for construction material that is paying them to again start up their mills.

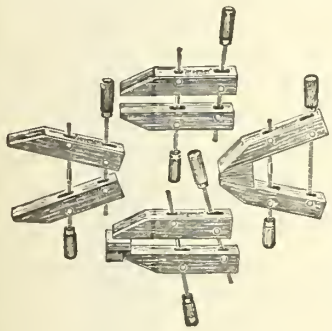
Hardwood flooring and interior trim producers have been very active since early spring. The automobile manufacturers are the chief consumers of hardwoods at present, especially thick elm, ash and maple. Wagons and carriage makers are witnessing a lull and musical instrument and agricultural implement makers are practically buying no supplies. The furniture factories are generally marking time and no large quantities of material are moving that way during the warm weather. However, everything points to a fairly prosperous year with the farmers both east and west and together with the completion of the building programme the demand for house furnishings should be healthy this fall.

It is only natural that the much looked for demand of wood materials of all kinds would present itself in the softwood market first, and if homes and industrial buildings continue to be built at the present pace for the remainder of the year the demand for better grades of both soft and hard woods is certain.

"Pony" Cabinet Clamp



For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.



"Jorgensen"

Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

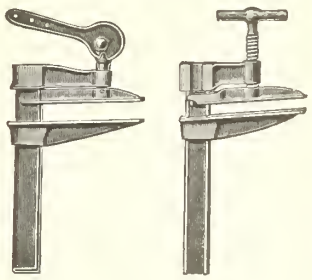
For Sale By

Aikenhead Hardware Limited .....Toronto
Caverhill Learmont Co. .....Montreal
Lewis Bros., Limited .....Montreal

Colt's Clamps

for the

Woodworker



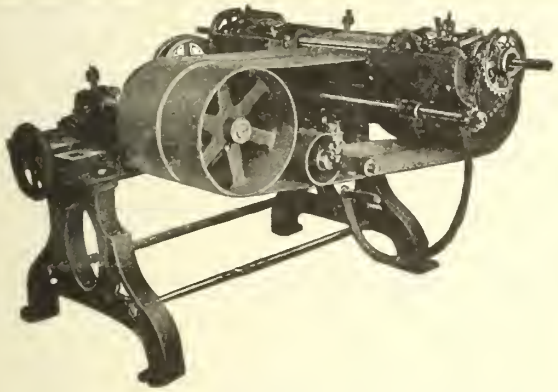
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



Give your Broom Handles a nice Smooth Finish and get Highest Prices for them. The "OBER" Automatic Sander will do the work Rapidly and Economically. We build Laths, Sanders, Rip-Saws, Bolters, chucks, Chucking Machines, etc. for making Handles of various kinds, Ball Bats, Whiffletrees, Neck Yokes, Spokes, Golf Shafts, etc.

Write for free catalogue No. 31.

The Ober Mfg. Co.

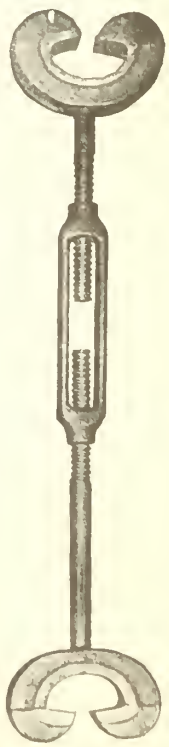
Chagrin Falls, O., U.S.A.

Better work follows the use of the "Empire"

There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

Get in touch with us now. We can make prompt delivery from stock.

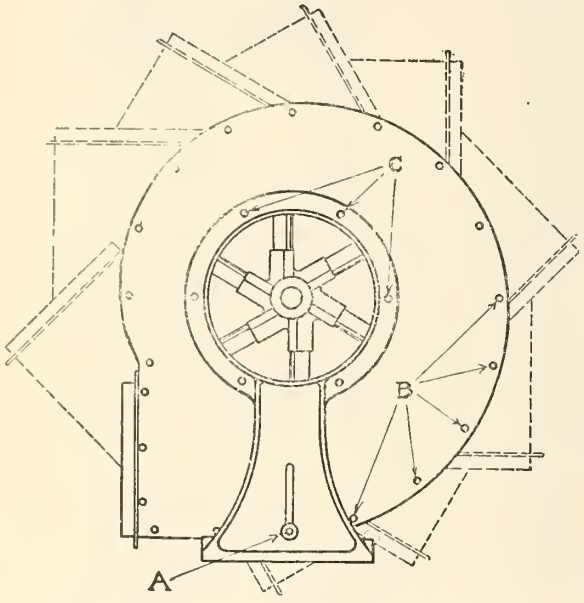
We specialize in all types of woodworking tools.



Empire Tool Works

Toronto - Ontario

Canadian Mill Exhausters



One of the features of the Canadian Planing Mill Exhauster is the reversible housing. It is easily adjustable to either hand and to any discharge.

By this arrangement one fan may be used to meet all requirements, thus eliminating crossed belts and sharp angles.

Let our engineering department help you plan your refuse exhauster system.

Write for catalogue 400-13.

Canadian Blower & Forge Co.
KITCHENER, ONT.

BOX NAILS and WIRE for Every Use

We manufacture a complete line of nails and wire in every style and size. Your special needs can be supplied. Write us today. We manufacture special styles to order.

Laidlaw Bale-Tie Co., Ltd.

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

QUALITY DRYING

Accomplished with

SPEED AND ECONOMY

Unequalled by any other kind of kiln

We will give you a guarantee to increase the capacity of your kilns regardless of present type, new or old.

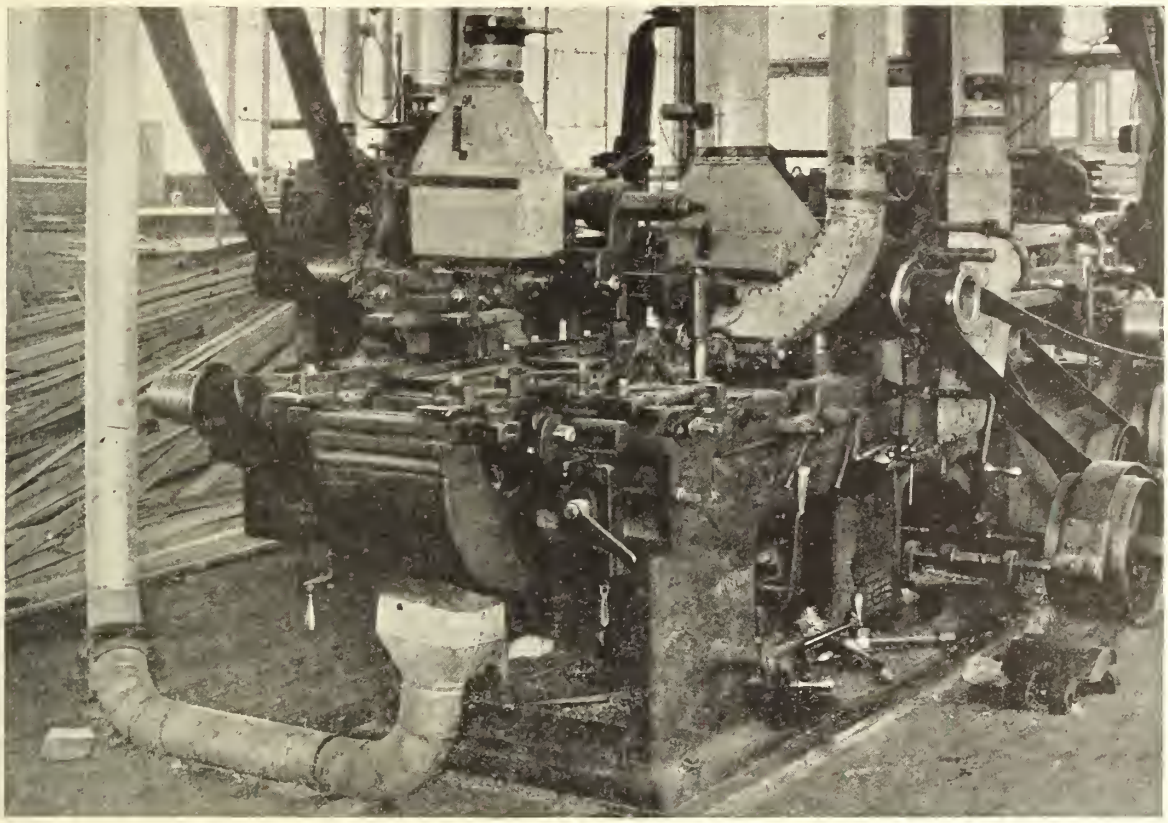
Write us for Illustrated Leaflets
on Kilns and Kiln Drying

GRAND RAPIDS VAPOR KILN
Grand Rapids, Michigan

Western Vapor Kiln Co , Seattle, Washington

Quite Often

you will find the very thing you are looking for in these advertising pages. It will pay you to read them.



Installation at the Housing Corporation, Waltham, Mass.

A Vacuum Cleaner at Every Cutting Head

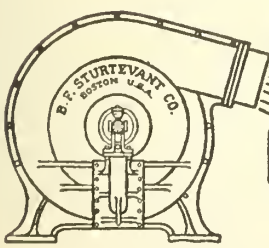
That is exactly what a correctly designed collecting and conveying system means in your plant.

But the system must be installed so that the mill may be kept entirely free from refuse and waste, even when you are running at maximum speed and capacity. There are many other problems connected with your output which must also be taken into consideration.

And that is where the long, varied experience of our collecting and conveying specialists can be of inestimable value to you.

Our engineers will be glad to look over your plant—without the slightest obligation.

Send for Catalogue No. 291



Sturtevant

REG. U.S. PAT. OFF.

PUTS AIR TO WORK

B. F. STURTEVANT COMPANY OF CANADA, LIMITED

TORONTO - - GALT - - MONTREAL

—Territorial Representatives—

Empire Engineering & Supply Co., Edmonton, Alta.—Kipp Kelly Ltd., Winnipeg, Man.

622

The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Co., Chicago, Ill.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARINGS
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

BAND SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, Que
Yates Machine Co., P. B., Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P.B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids Mich.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner Mass.
Williams Machinery Co., A. R., Toronto, Ont.

BEVEL & MITRE SAWS
Pettingell Machine Co. Amesbury, Mass.

BIRCH
Edward Clark & Sons, Toronto, Ont.

BLOWERS
Canadian Blower & Forge Co., Kitchener, Ont.
Sturtevant, B. F. & Co., Galt, Ont.

BLOW PIPING
Canadian Blower & Forge Co., Kitchener, Ont.

BOILERS
Engineering & Machine Works, St. Catharines, Ont.

BORING MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Son Co., L. G., Gardner, Mass.
Nash, J. M., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Reynolds Machine Co., Massillon, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Valley City Machine, Works, Grand Rapids, Mich.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CARVINGS
Klise Mfg. Co., Grand Rapids, Mich.
Decorators Supply Co., Chicago, Ill.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Preston Woodworking Machinery Company, Preston, Ont.

CARVED WOOD MOULDINGS
Klise Mfg. Co., Grand Rapids, Mich.

CASTERS
Foster, Merriam Co., Merriden, Conn.
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Shurly-Dietrich, Galt, Ont.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Bell Machine Co. Oshkosh, Wis.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garloek Maehinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company, Preston, Ont.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

CLAMP CARRIERS
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.

CRATING LUMBER
Lloyd, W. Y., Toronto, Ont.
Colborn, C. B., Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D., Guelph, Ont.

CUT-OFF SAWS
Atkins & Co., E. C., Hamilton. Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garloek Maehinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Maehinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.
Richards-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

DOWEL MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
W. S. Hawker Mfg. Co., Dayton, Ohio.

DOWELS
Canada Wood Specialty Co., Ltd., Orillia, Ont
Rowe Mfg. Co., Newaygo, Mich.

DRIERS(Hot Plate)
Merritt Eng & Sales Co., Lockport, N.Y.

DRIERS (Veneer)
Merritt Eng & Sales Co., Lockport, N.Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont
Cutler Desk Co., Buffalo, N. Y.
Grand Rapids Veneer Works, Grand Rapids Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont

DYNAMOS
Industrial Engineering Co., Toronto, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont
Simonds Canada Saw Co. Montreal, P.Q.

EDGER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

ENAMELS
Cosmos Chemical Co., Port Hope, Ont.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Garloek Machinery Ltd., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co
Sturtevant, B. F. & Co., Galt, Ont.

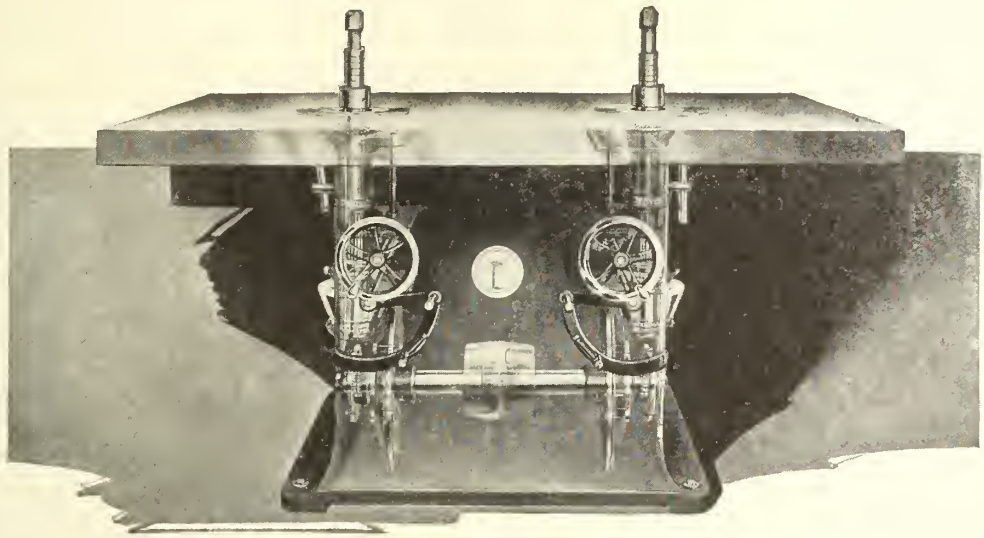
FEED ROLLS
Atkins & Co., E. C., Hamilton, Ont.

FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FIBRE PRODUCTS
Carter, E. T., Toronto, Ont.
National Patent Reed Sales Co., Philadelphia, Pa.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

SKF



Ball Bearings Permit and Maintain
High-Spindle Speed with Accuracy and Low Power Consumption

SHAPER operators know that if there is friction in the shaper bearings sufficient to cause wear and misalignment, the consequent vibration soon becomes a potent force of destruction which rapidly ruins the serviceability of the shaper. When self-aligning ball bearings are used the inner race tilts with the shaft and the bearing can never bind.

Spindles thus equipped require less power, run smoothly and silently, and remain absolutely true. As a result, the worker can do his work more easily and obtain a greater output. At the same time his machine is not subject to frequent shutdowns. Ball bearings eliminate the wearing, rubbing friction which causes burnt-out bearings and an endless round of troubles that lower production and eat up profits.

See that all your shapers are equipped with **SKF** marked ball bearings. They effect remarkable savings in power, belts, time and labor, and enable the tools to maintain high speed with lower power consumption.

CANADIAN **SKF** COMPANY, LIMITED

TORONTO & MONTREAL

715

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y.
Oakey & Sons, Limited, John, London, S.E.1.
(Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.
Dominion Appraisal Co., Toronto, Ont.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GEARS
Hamilton Gear & Machine Co., Toronto, Ont.

GLUE
Canada Glue Co., Brantford, Ont.
Cannon Canadian Co., Toronto, Ont.
Coignet Chemical Products Co., New York N.Y.
Kane Manufacturing Co., Chicago, Ill.
Monite Waterproof Glue Co., Minneapolis, Minn.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Rush Lumber Co., Memphis, Tenn.
Thomas & Proetz Lumber Co., St. Louis Mo.
Turner-Farber-Love Lumber Co., Leland, Miss.

HAIR (Curled)
Blocksom & Co. Michigan City, Ind.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE
Laidlaw Bale-Tie Co Hamilton, Ont
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.

HARDWOOD DIMENSION STOCKS
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
Anderson-Tully Co., Memphis, Tenn.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio
Bonner & Sons, J. H., Memphis, Tenn.
Bruce Co., E. L., Little Rock, Ark.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Clark, Edward & Sons Toronto
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Dudley Lumber Co. Inc., Memphis, Tenn.
Farrin Lumber Co. M. B., Cincinnati, Ohio.
Frye Lumber & Veneer Co., J. W., Dayton, O.
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La
Hafner **Manufacturing Co., St. Louis, Mo.**
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co. Toronto, Ont.
Kinnon Lumber Co., Ltd., Toronto, Ont.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Otis Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont
Pickrel Walnut Co., St. Louis, Mo.
Richards Hardwood Co., Memphis, Tenn.
Rush Lumber Co., Memphis, Tenn.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn
Stimson & Co., J. V., Owensboro, Ky.
Sullivan, Frank T. Buffalo, N.Y.
Thomas & Proetz Lumber Co., St. Louis Mo.
Turner-Faber-Love Lumber Co., Leland, Miss.
Vail Cooperage Co., Fort Wayne, Ind.
Whiting Co., Wm. S., Johnson City, Tenn.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng & Sales Co., Lockport, N.Y.
Van Atta & Co., E. B.., Olean, N. Y.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LACQUERS
Cosmos Chemical Co., Port Hope, Ont.
Celluloid Zapon Co., New York, N. Y.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company. Kitchener. Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie. H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont

LEGS
Klise Manufacturing Co., Grand Rapids, Mich.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Preston Woodworking Machinery Company,
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.

MOTORS
Industrial Engineering Co., Toronto, Ont.

MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.
Yates Machine Co., P.B. Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PAINT
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Calhoun Plywood Co., Sheboygan, Wis.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

Three Operators With But a Single Thought—

The Efficiency Of Carborundum Brand Garnet Products

HERE are three men doing three widely varied sanding jobs and doing them mighty well.

One is sanding gumwood boxes for toy blocks. He takes 1/64 off the four sides sanding 1,000 boxes complete with one Carborundum Brand Garnet Belt.

He says he never had a belt to do the work so well.

Another is sanding washing machine bottoms on a drum sander. His comment was that "Carborundum Brand Garnet stands up better—does more work, lasts longer. We have no kick of any kind."

And then we have the hand sanding of phonograph cabinets. The operator here says that he gets a cleaner, more uniform finish, the paper doesn't crack or peel and it's fast cutting and extremely flexible.

Carborundum Brand Garnet Products
Make Good Sanders Better Sanders

The Carborundum Company

Niagara Falls, New York, U.S.A.

New York, Chicago, Boston, Philadelphia, Cleveland, Cincinnati, Pittsburgh, Grand Rapids, Milwaukee, Detroit. The Carborundum Company, Ltd., Manchester, Eng.

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery **Ltd., Toronto, Ont.**
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Calhoun Plywood **Co., Sheboygan, Wis.**
Guelph Patent Cask Co. Scotstown, P.Q.
Wisconsin Veneer **Co., Rhinelander, Wis.**

PERIOD MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & **Co., E. T., Toronto, Ont.**

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, **Galt, Ont.**
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mackenzie Machinery Co., D., Guelph, **Ont.**
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Klise Mfg. Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co., Herman, Brooklyn, N.Y.

SASH, DOOR & BLIND MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery **Ltd., Toronto, Ont.**
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SATINWOOD
Willey Co. C. L. Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P.B. Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKenzie Machinery Co., D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW TENONERS
Pettingell Machine Co. Amesbury, Mass.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

SHELLAC
Kasebier-Chatfield Shellac Co.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co. Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW FILING MACHINERY
American Saw Filing Machine Co. Boston, Mass.

SAW TENONERS
Pettingell Machine Co. Amesburp, Mass.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Bruce Woodworkers Ltd. Chesley, Ont.
Walter & Company, B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Klise Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.
Walter & Sons, J. Kitchener, Ont.

TWIST WORK
Klise Mfg Co., Grand Rapids, Mich

UPHOLSTERY
Oriental Textiles Co., Oshawa, Ont.

NEW AND USED

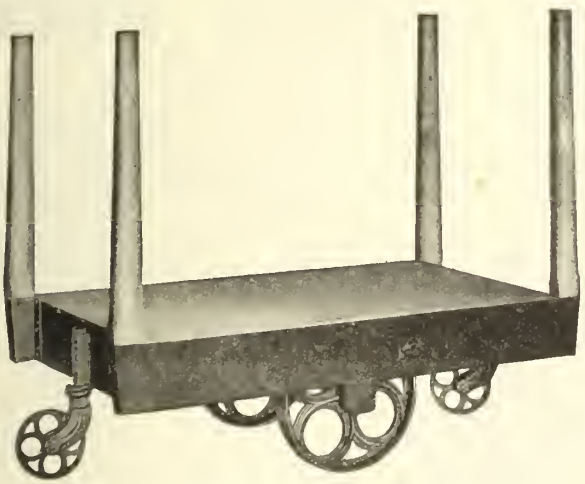
Woodworking Machinery

C.M.C. double carriage cut-off saw.
60″ Fay & Egan re-saw.
60″ Egan band re-saw.
54″ McDonough horizontal band re-saw.
42″ West Side band re-saw.
12″ C.M.C. four-side moulder.
American variety woodworker.
No. 551 C.M.C. chain saw mortiser.
18″ Defiance handle lathe.
30″ Boss double surface planer and matcher.
24″ Clark-Demill planer and matcher.
24″ Yates, single surface planer.
24″ Cowan pony planer.
20″ Preston pony planer.
48″ Berlin, three-drum sander.
42″ Invincible three-drum sander.
20″ American wood scraper.
Preston double head tenoner.
Gerlach stave machine.
Long lath bolter.

Write for full particulars and our complete stock list

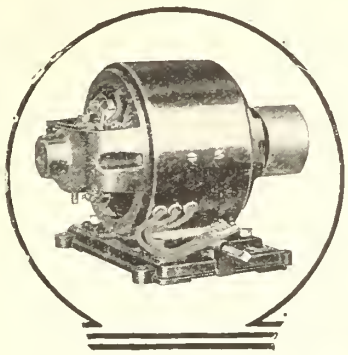
H. W. Petrie, Limited
131—147 Front Street West
Toronto

NOW IS THE TIME



To Cut Your Production Cost by Using
"GLOBE"
ALL STEEL FACTORY TRUCKS
Made in 3 sizes:
24″ x 52″ 28″ x 58″ 34″ x 70″

Globe Vise & Truck Co.
GRAND RAPIDS, MICH.



MOTORS

RELIABILITY
KNOWLEDGE
PRICE

Motors—60 Cycle

1—3 H.P. Packard, 3 phase, 220 or 550 volts.
6—1/6 H.P., single phase new.
1—5 H.P. Can. Gen. Electric.
1—7½ H.P. Lincoln, and one 7½ H.P. Fairbanks.
1—10 H.P. Gen. Elec. and Lincoln.
1—20 H.P. General Electric.
1—30 H.P. newly rewound by Swedish General Electric.
4—25 H.P. General Electric.
1—50 H.P. General Electric.
1—75 H.P. General Electric.
1—100 H.P. Westinghouse and General Electric.
Above 5 H.P. motors equipped with regular starters.

Motors—25 Cycle

1—5 H.P. Crocker-Wheeler, 1500 r.p.m., 220 volts.
1—2 H.P. Langdon Davies, 1500 r.p.m., 500 volts.
1—40 H.P. Westinghouse, 720 r.p.m.
1—15 H.P. British Gen. Elec.
Other various sizes and new Westinghouse stock all sizes.

Direct Current Motors and Generators
125-250 Volts

1 K.W.
2 K.W.
3 K.W.
5 K.W.
10 K.W.
Westinghouse
Can. General Elec.
Lincoln.

Complete with rheostats and pulleys.

60 Cycle, 3 Phase Generators

60 Cycle, 3 Phase Generators
30 K.W.
50 K.W. 1200 r.p.m. General Elec. and Westinghouse.
75 K.W. Westinghouse.
100 K.W. General Elec., 2300 volts, 900 r.p.m.
300 K.W. Westinghouse, 200 r.p.m.
600 K.W. Electrical Machinery 225 r.p.m.
All. complete with exciters and rheostats.

2—175 H.P., 3 cylinder gas, gasoline or crude oil Westinghouse Vertical Engines —250 r.p.m.

Industrial Engineering Company of Canada Ltd.
CONSULTING ENGINEERS - ELECTRICAL EQUIPMENT
R. G. LEE, General Manager
Carlaw Building, Toronto - Royal Bank Building Windsor, Ont.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont
Frye Lumber & Veneer Co., J. W., Dayton, O.
Guelph Patent Cask Co. Scotstown, P.Q.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mohawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Wisconsin Veneer Co., Rhinelander, Wis.
Willey Co. C. L. Chicago, Ill.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Van Atta & Co., E. B., Olean, N. Y.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Des Moines Sawmill Co., Des Moines, I.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.
Sullivan, Frank T. Buffalo, N.Y.

WASTE
Carter, E. T., Toronto, Ont.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WOODWORKING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Elliot Machinery Co. Belleville, Ont.
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Pettingell Machine Co. Amesbury, Mass.

WOOD TURNING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Elliott Machinery Co., Belleville, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P.B. Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids, Mich.

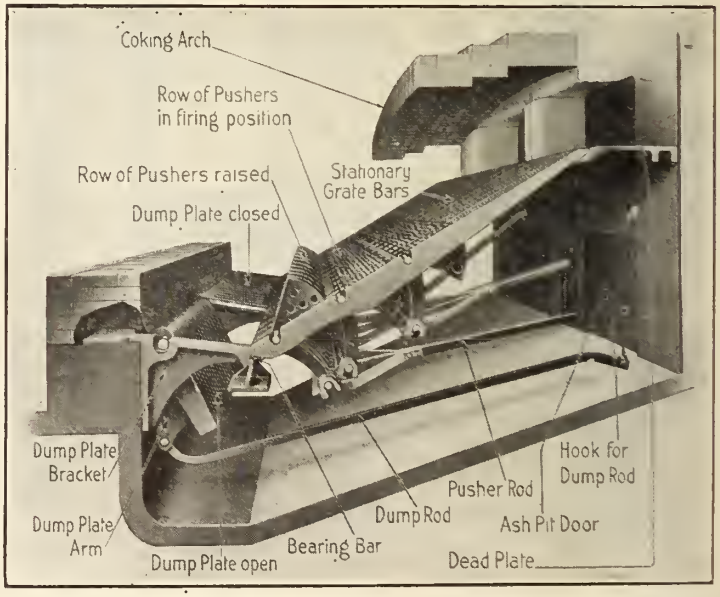
WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

Save Money in Your Boiler Room

Any power plant up to 500 h.p. can make important fuel savings with the National Hand Fired Stoker. Not only that but ordinary labor can give you expert fireman stoking results through the simple manipulation of the Push Rods that keep the fuel moving downward on the fire bed.

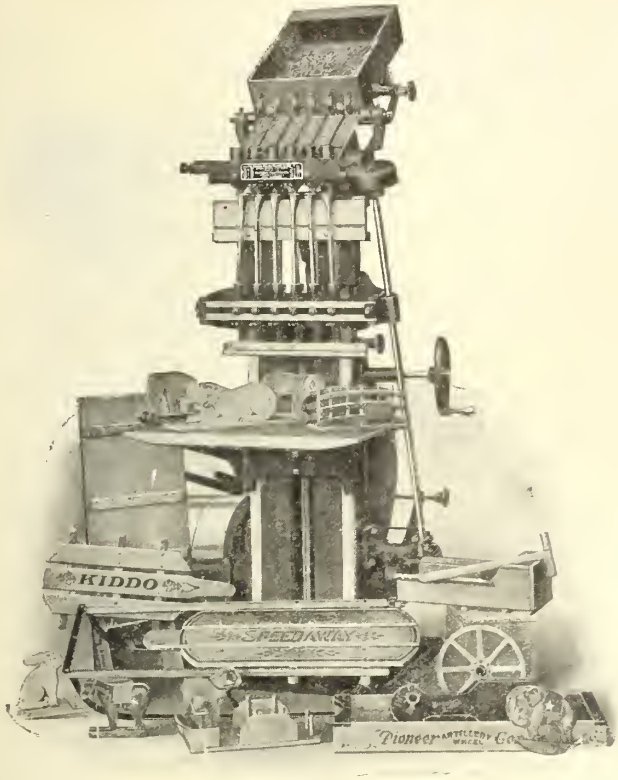
Perfect combustion, with any type of fuel, and no smoke are outstanding results.

Made by us in Canada. Can be installed in your present plant. Let us send you illustrated descriptive booklet.



Engineering and Machine Works of Canada, Limited
St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal



Morgan No. 6 Nailing Machine

MORGAN
NAILING MACHINES
Used in Nailing Wooden Toys

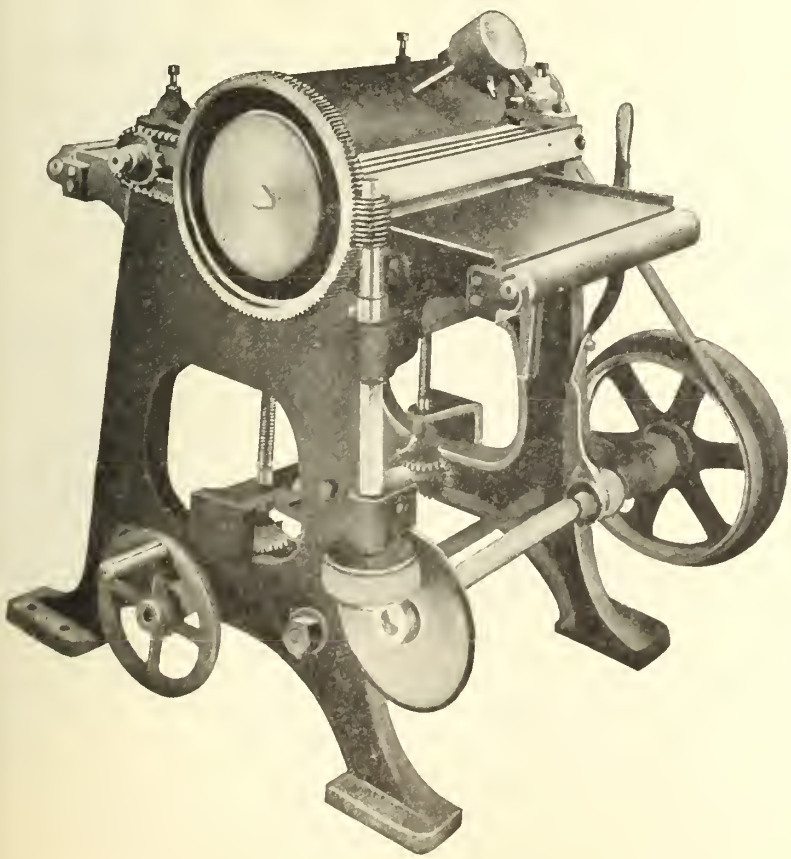
Many manufacturers of American Wooden Toys use our machines for driving 5/8" to 1 1/8" nails. Machines are adjustable in operation and can be adapted to any kind of nailing work.

If you are driving nails by hand in making boxes, crates, toys, any woodenware articles, figure the cost. It is expensive.

Then send us samples of your work. Get an estimate of the cost of nailing on a Morgan Nailing Machine. Compare the figures. We'll leave the rest to your judgment.

Send us your nailing problems. We shall be pleased to give them our careful consideration and advise you regarding equipment for handling them. We invite your inquiry.

Morgan Machine Company
Rochester, N. Y.



The Elliot Bull Dog Planer

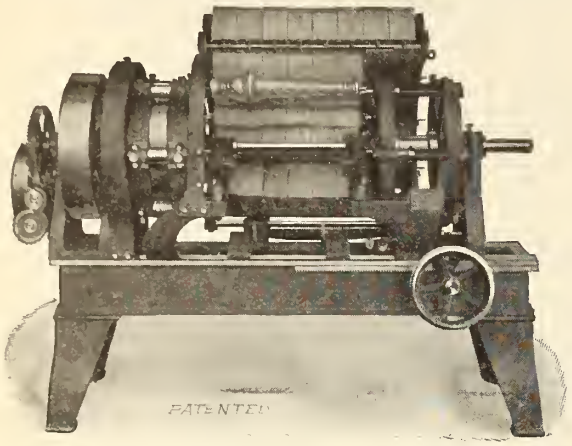
6" x 16"

The facts that the head is run by a worm gear; no pinions on the head and that the feed rolls are driven independent of the head excludes vibration. Hence—it planes smoother than any other Pony Planer made. Also it uses less power.

Write for Prices and Catalogue

Elliot Machinery Co.
Limited
Belleville, - - - Ontario
CANADA

ARE YOU SATISFIED



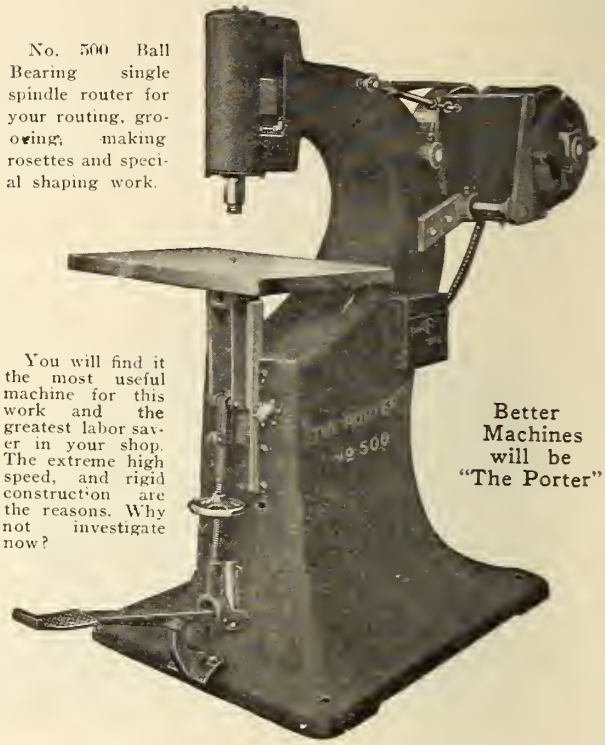
With the quality, quantity and cost of sanding your furniture turnings? If you have a Nash Sander, your satisfaction is justified, not otherwise.

Let me show you the "better way."

J. M. NASH, Milwaukee, Wis.

Use the "PORTER"

No. 500 Ball Bearing single spindle router for your routing, grooving, making rosettes and special shaping work.



You will find it the most useful machine for this work and the greatest labor saver in your shop. The extreme high speed, and rigid construction are the reasons. Why not investigate now?

Better Machines will be "The Porter"

C. O. Porter Machinery Co.

666 Front Ave., N.W. GRAND RAPIDS, MICH.

We Manufacture a complete line of

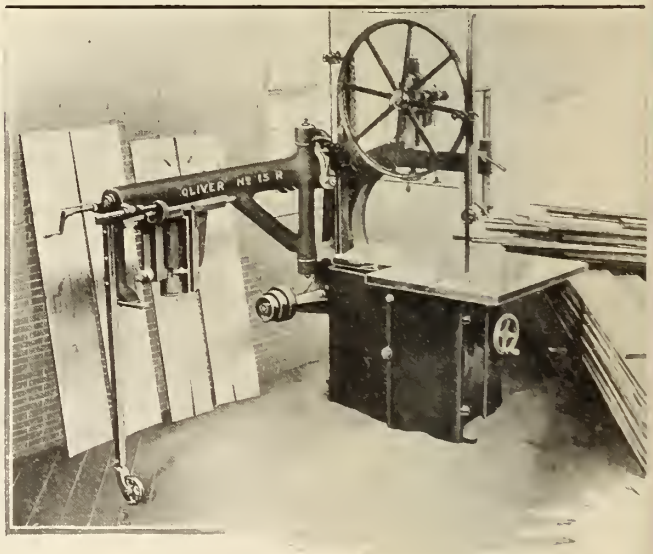
Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.

GARDNER, MASS.

The "Oliver" Combined Band Re-Saw and Scroll Saw, 38-in.



The above photograph shows one of the many installations of a general utility machine of more than ordinary merit. The first function of the "Oliver" Band Re-saw is to save lumber. But time is worth saving, too. The "Oliver" Band Re-saw is equipped with safety guards that eliminate danger of accidents to the utmost.

SAVE LUMBER—SAVE LABOR

OLIVER MACHINERY COMPANY

Grand Rapids, Mich.

SIMONDS

Novelty SAWS

High-grade Steel and perfect mechanical construction make Simonds Novelty Saws leaders everywhere. They cut smooth and hold their tension and cutting-edge longer.

We also make Concave, Groover and Special Circular Saws as well as Big Circular and Band Saws, Planer Knives and Files.

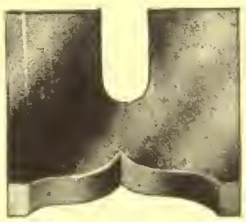
Write for Prices

Simonds Canada Saw Co., Limited

"The Saw Makers"

Montreal, Que. - St. John, N. B. - Vancouver, B. C.

ATKINS



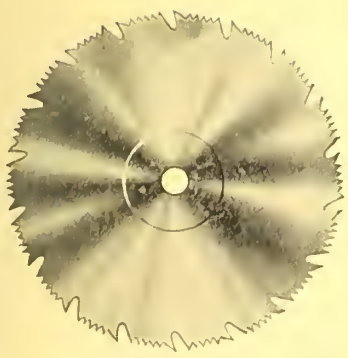
STERLING QUALITY

SAWS and KNIVES ECONOMIZE

ARE your saws and knives wasting your lumber? If so, why not turn that waste into a profit by installing

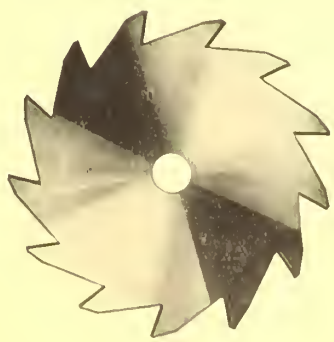
Atkins Sterling Quality Saws

and Machine Knives



Some of the largest woodworking mills in the country are using Atkins Saws exclusively, because they increase production, stop waste and make a name for themselves wherever they go.

Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.



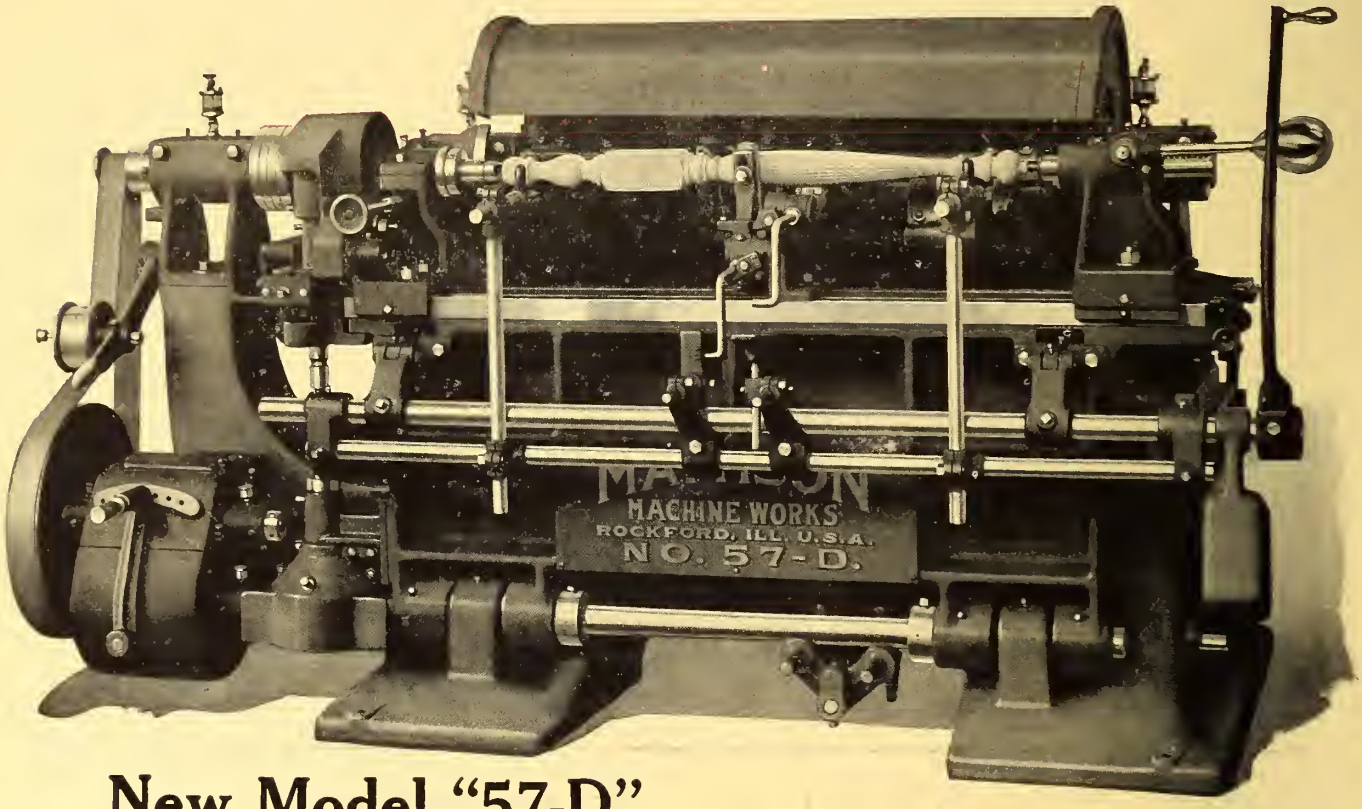
E.C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

The Latest Improved Mattison Lathe

The Standard Machine Turner



New Model "57-D"

IN this New Model D Mattison Automatic Shaping Lathe are found the many improvements and refinements which twenty-five years' experience have shown to be desirable and necessary in a machine of this type.

It is not a radical departure in principle, nor is it a case of taking an old machine and patching on a new piece here, or cutting out something there. Yet it has been completely redesigned from the ground up. It has been made heavier where added weight is essential. Its operation has been made more convenient and faster. Attachments have been simplified to facilitate adjustments and to save time when changing. Gearing has been changed to eliminate readjusting when substituting different work-holding devices, thus insuring the gears against undue wear.

In a word, the developments and refinements on this new Model D Mattison Automatic Shaping Lathe leave nothing to be desired as to efficiency, operating convenience and simplicity. It is the culmination of twenty-five years' experience in continuously developing a principle proven right at the start.

Ask for bulletin describing new features.

Branches:
CHICAGO
1735 Republic Bldg.

GREENSBORO, N. C.
513 American Bk. Bldg.

MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.

Branches:
NEW YORK
602 Times Building

SAN FRANCISCO
553 Monadnock Bldg.

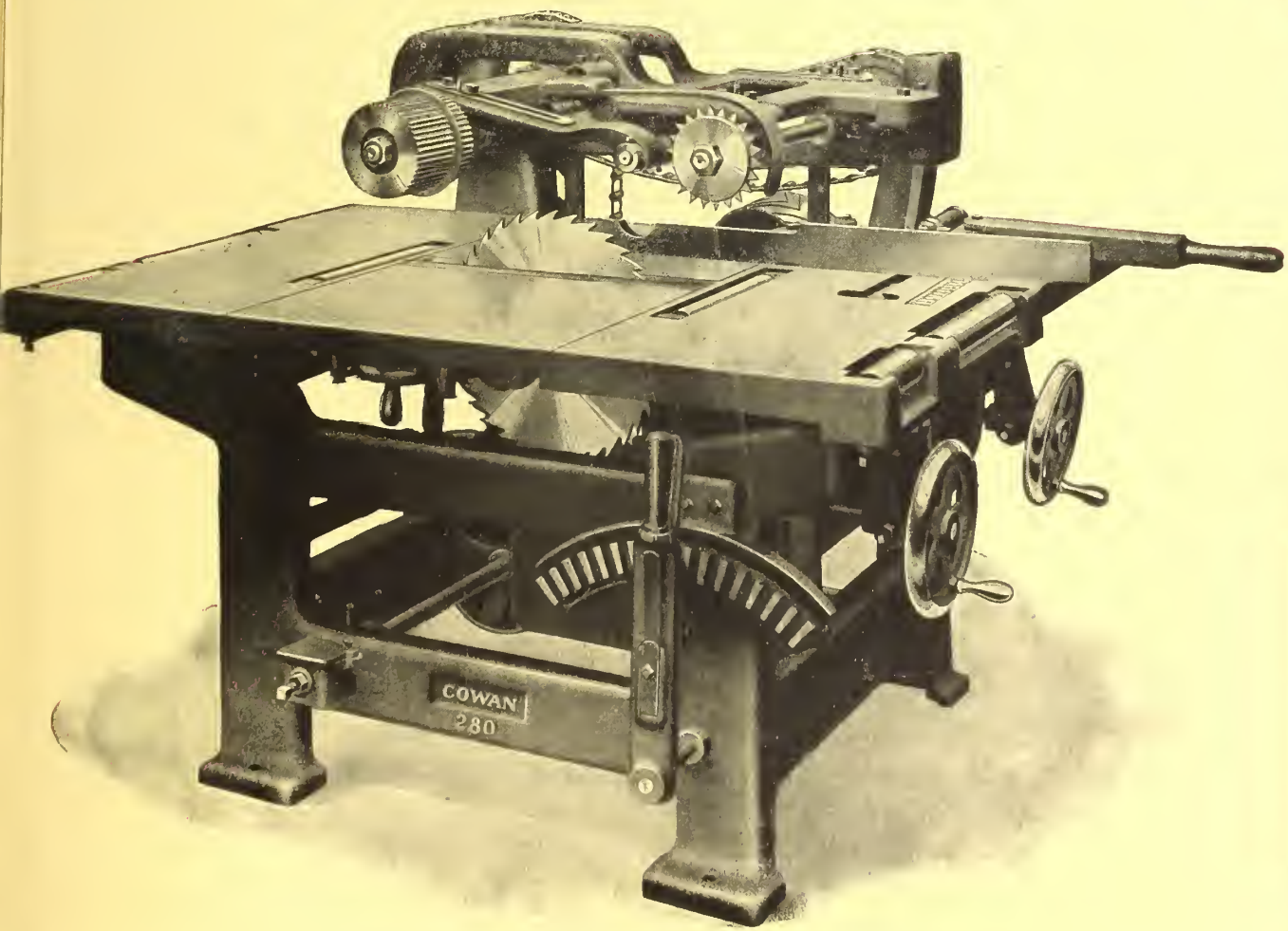
Sales Representatives for New England: BAXTER D. WHITNEY & SONS, Winchendon, Mass.

ome Twenty-Two TORONTO, August, 1922 Number Eight

CANADIAN WOODWORKER and Furniture Manufacturer

Power Feed Rip Saw 280

Variable Feed, Large Table, Simple, Strong, Compact



Woodworking Machinery that Satisfies

COWAN & COMPANY OF GALT LIMITED

Galt, Ontario, Canada

Alphabetical Index to Advertisers, Page 14

INTRODUCING---
THE LATEST---

Ball Bearing Shaftless Motorized Hand Planer and Jointer

Massive one piece frame supports table full length with utmost rigidity.

Tables held in perfect alignment by inclines having independent micrometer adjustment.

Journals mounted on self-aligning Ball Bearings

Four Sizes 8″ — 12″ — 16″ — 24″

No. 506 Ball Bearing Shaftless Motorized Hand Planer and Jointer

J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St. - - Cincinnati, Ohio, U. S. A.

Exclusive Agents for the Dominion: A. R. Williams Machinery Company, Ltd., Toronto, Ont.
Branches: Montreal, St. John. N. B., Winnipeg, Vancouver

The Specialty House on Woodworking Machinery

Described below you will find a collection of **Moulders** and **Saws** taken from our present stock of **New, Rebuilt** and **Used Machinery.** We are in a position to quote very attractive prices on these machines for the reason that every machine on our floor has been recently **Repriced** to **New Low Figures.**

NEW with us means machine has never been in operation
REBUILT means re-manufactured by us in our own shops
USED means machine is in good working order

Write now giving the number of machine you are interested in and we will promptly place before you full particulars and prices.

Stock No. MOULDERS.

2628 Cowan 13" Four Sided Moulder, square heads on top, bottom and side spindles, top head fitted with slats close to lip for use of beading and other small cutters; solid type top and bottom heads; straight knives on all heads; similar to Cowan M-152; side heads 5" high, tight and loose pulleys.

2621 Hespeler (similar to C.M.C. 303) 10" Four Sided Moulder, square heads on top, bottom and side spindles; top head slip on type; side heads 4" high, straight knives on all heads; tight and loose pulleys.

2629 American (Houston) 8" Four Sided Moulder, square heads on top, bottom and side spindles; solid top and bottom head, side heads 4" high; straight knives on all heads, tight and loose pulleys.

2635 Cowan 10" Four Sided Moulder, square heads on top, bottom and side spindles; top head slip on type; side heads 4" high, straight knives on all heads; similar to Cowan M-223, tight and loose pulleys.

2636 Cant-Laidlaw 8" Four Sided Moulder, brass heads fitted to all spindles, top head 9" long; bottom head 8" long, side heads 4" high; rear table swings to back of machine; straight knives on all heads, tight and loose pulleys.

2637 Cant-Gourlay 8" Four Sided Moulder, brass heads on all spindles, side heads 4" high; rear table swings to rear; straight knives on top, bottom and side spindles, tight and loose pulleys, old type open frame machine.

2638 Two Sided Dowel Sticker, top and bottom spindles; for running flag sticks, equipped with heads knives for ⅜" rounds; heads 5½" long; cutters 3⅝" long, two cutters to each head; two infeed rolls 4" dia. table lowers for stock approximately 3" in thickness; has countershaft with tight and loose pulleys, similar to McGregor-Gourlay XP or Cowan M-149.

2634 Cowan 12" Four Sided Moulder, square heads on top, bottom and side spindles; solid type top and bottom heads, side heads 4" high, straight knives on all heads, similar to Cowan M-152, tight and loose pulleys, ball bearing loose pulley.

SAWS.

2593 American Fig. 6385 No. 30 Double Arbor Universal Saw Bench, table in two sections which separate for use of dado heads or other heads up to 2½" wide; stationary table 23" wide; movable or sliding table (which moves on six rollers as well as on slide) 17" wide; table 40" wide x 48" long, capacity rips from 1/16" to 27½" and cuts off to 31" wide when saw is set for 2" stock; whole table tilts to any angle up to 45 degrees, carries saws up to 18" diameter, equipped with one 18" rip saw, one 18" crosscut saw; micrometer rip gauge; three sliding cut-off gauges, swivel type; movable table laid out with bevel protractor or 180 degree circle with pin holes for all principal angles for cutting off on angle; countershaft with tight and loose pulleys (new machine).

2599 American Fig. 5610 No. 25 Edging Saw, fitted with saw in table, with two movable chains running one on either side of saw, with fill-up plate in front of and in rear of saw blade, preventing splinters from getting under chains; four adjustable top feed rolls; capacity stock as short as 5" up to 20" wide; using a 14" saw stock 3½" can be ripped; saws up to 16" can be used; table is 52" long and 32½" wide, speed of feeds, 48', 86' and 140' lineal per minute, equipped with one 12" saw blade; arbor outside of frame, no countershaft; (new machine).

2602 American Fig. 5859 No. 3 Double Cut-off Saw, with self-contained countershaft, equipped with friction power feed to movable headstock in addition to ordinary hand wheel movement; bevel rip gauge, sliding cut-off gauge operates on accurately planed ways and rolls; for square cutting off; capacity is from 8" to 6' 9" in length, 4" thick and 30" wide, two 16" saws 1¼" hole included; tight and loose pulleys on countershaft (new machine).

2610 American Fig. 575 No. 2 Hand Feed Rip Saw, with arbor pulley outside of frame, no countershaft, extended arbor for saws 10" between inside and outside saws, table hinged at rear and raises by hand wheel; adjustable rip gauge; capacity rips up to 24" wide and stock up to 4" thick; table is 38" x 54", arbor pulley 7" x 7¼" runs 2400 r.p.m. one 16" saw 1¼" hole included.

2612 Blind Slat Resaw, similar to McGregor-Gourlay T.N. suitable for blind slats or other similar stock, carries gang of saws on arbor with series of collars; length of arbor 7", on countershaft, diameter of saw blades 6".

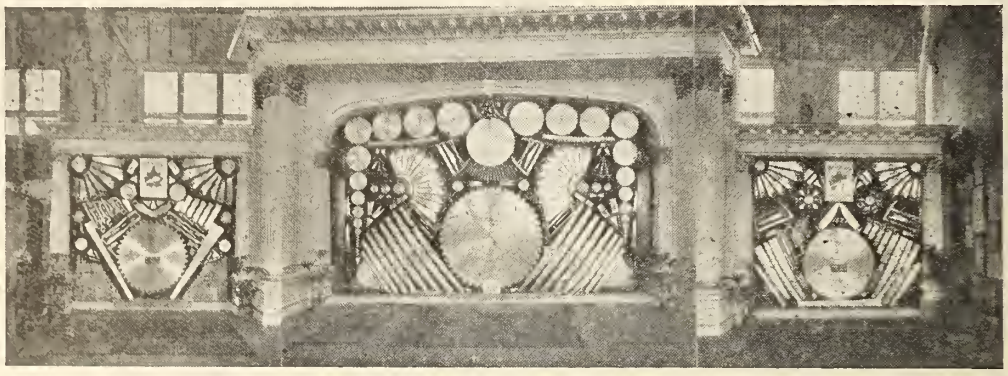
2622 Preston No. 132 36" Band Saw, with solid lower wheel, one ½" saw blades, tilting table, self-contained tight and loose pulleys.

2631 Mershon Band Edging Saw, 14" wheels, 3½" blade, infeed table, with friction adjustment to rip gauge, top feed rolls, with return roll for stock, self contained countershaft.

GARLOCK MACHINERY LIMITED
WOOD WORKING AND METAL WORKING MACHINERY
163 DUFFERIN ST. TORONTO TELEPHONE, PARKDALE 7855

See Us About All Your Machinery Needs

MAPLE LEAF SAWS



A Saw For Every Purpose

Used by all the principal Woodworking & Furniture Mfgs.

Throughout Canada

Cross-Cut Saws
Band Saws
Dado Heads

Special Saws
for
Special Work

Circular Saws
Hand Saws
Woodworking Cutters and Knives

Manufactured by
SHURLY-DIETRICH, LIMITED, The Largest all-Canadian Saw Manufacturers
GALT, Ontario

ASK ABOUT THEM

Yates

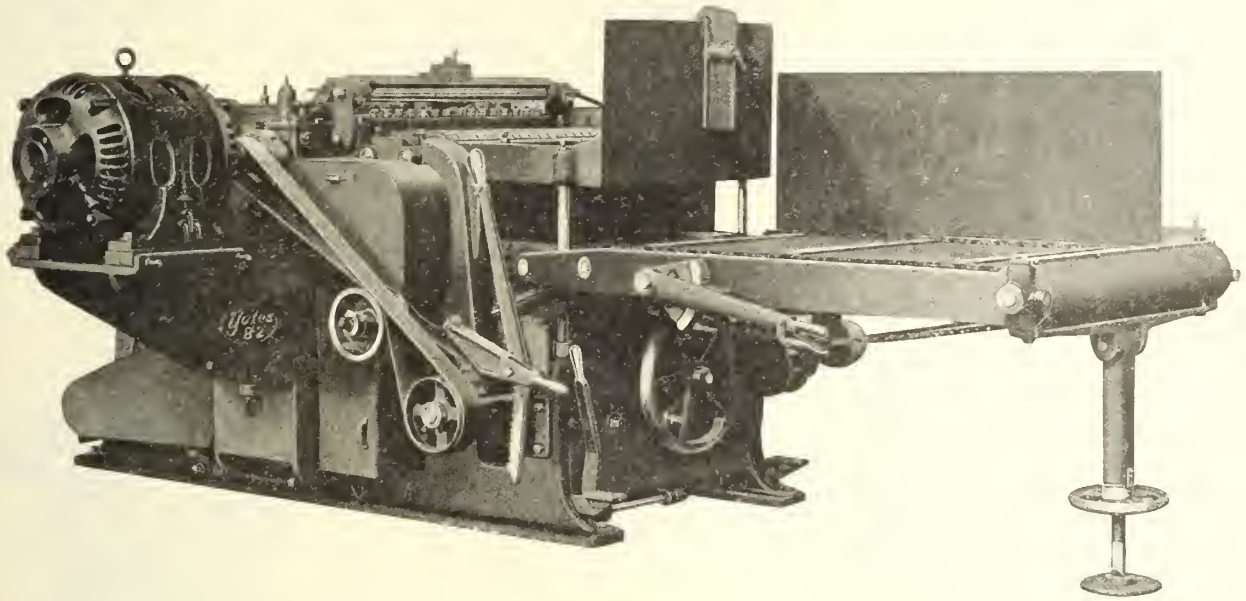
NEW A. B. NAILING MACHINES

Will nail a box together in three strokes

P. B. Yates Machine Co. Ltd.

Hamilton, Ontario

The Newest Thing in Surfacers— The Last Word in Efficiency



Yates

TYPE B-2 DOUBLE SURFACER

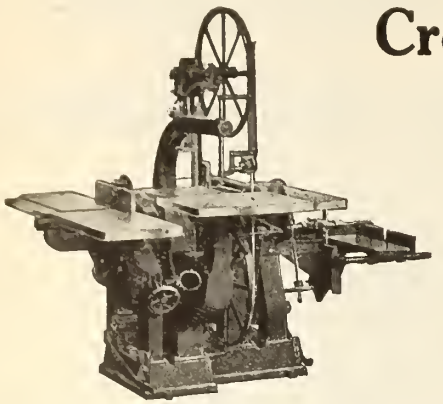
Yates

Built for Furniture, Box Factories and the average Planing Mill. Nicknamed the Price of Production, because it produces the goods in a Princely manner. Gives a high grade finish at speeds up to 100 feet per minute. With Hopper Feed as shown, short stock can be piled on the hopper and surfaced as fast as long stock. Durable – compact —convenient. Built to last, of the best material.

Get our new illustrated circular and learn more about this Price of Production.

P. B. Yates Machine Co. Ltd.

Hamilton, Ontario



Crescent Universal Woodworker

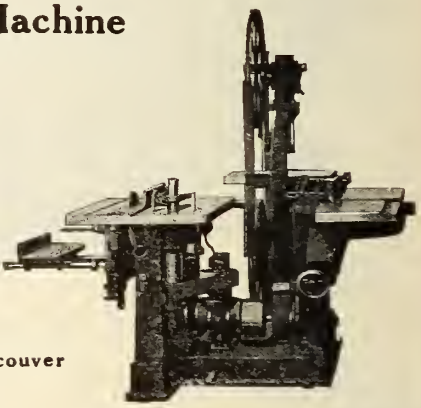
SAVES TIME AND EARNS MONEY

To the builder and contractor contemplating large building operations the Crescent Universal woodworker will mean a large saving in mill work, besides the convenience of having material cut and finished on the job when and where they are wanted. The sawyer's time alone will pay for the machine in a short while. The avoidance of delays which this machine makes possible also results in very important savings, as it assures that the job will not be held up for lack of material from the mill.

Every Builder should have this Money-making Machine

Standard equipment includes—Band Saw, Saw Table, Jointer, Boring Machine and Shaper. A number of other attachments can be added to increase the scope and usefulness of the machine. Floor space is limited and power required for operation moderate.

Write for further information.



A. R. Williams Machinery Co., Ltd.

Dept. C. W., 64 Front St. W., Toronto

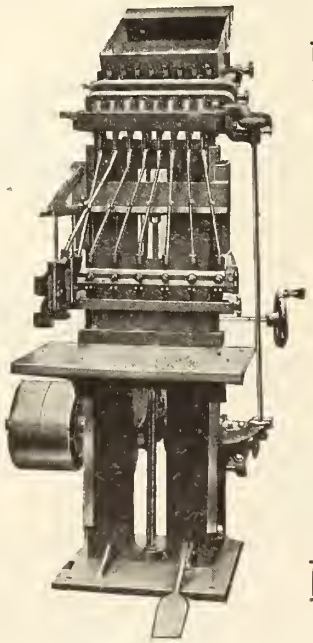
Halifax, St. John, Montreal, Winnipeg, Vancouver

If it's Machinery—Write Williams

MADE IN SCOTLAND

ENTIRELY AUTOMATIC

EASILY OPERATED



MACHINES FOR PLAIN OR ZIGZAG NAILING

BOX NAILING AND **CLEATING MACHINES**

ALSO MADE FOR CLEATING or BATTENING

INSTANTLY ADJUSTED

MADE IN ALL SIZES

MAY WE SEND YOU A CATALOGUE?

MATTHEW WYLIE & Co. Ltd.

81 PORTMAN STREET, GLASGOW

The Shimer Round Safety Cylinder with High Speed Knives

A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

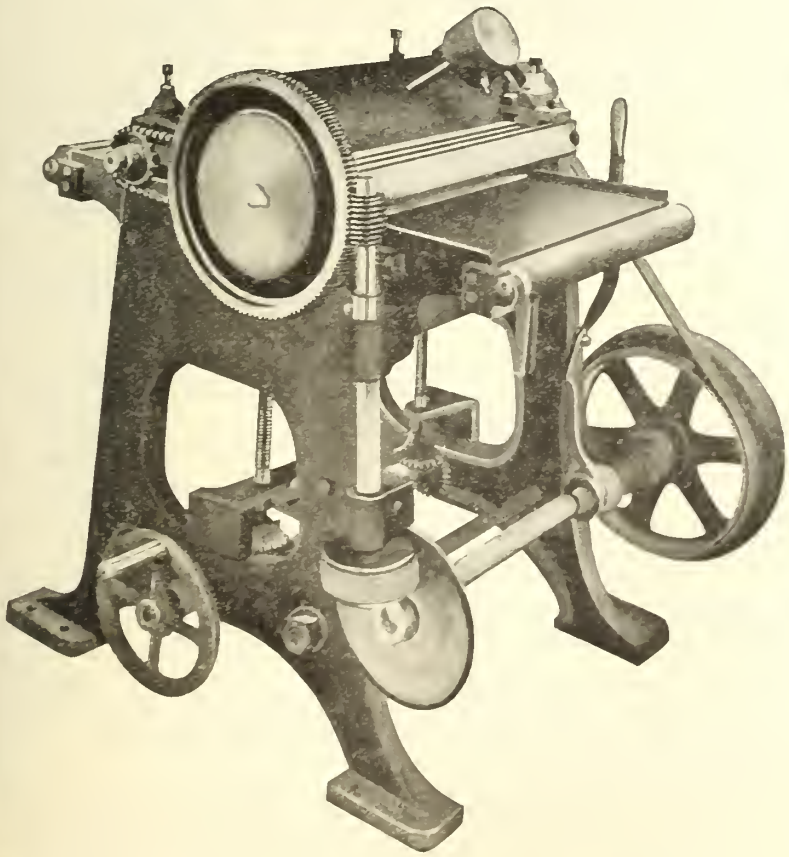
Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO



The Elliot Bull Dog Planer

6" x 16"

The facts that the head is run by a worm gear; no pinions on the head and that the feed rolls are driven independent of the head excludes vibration. Hence—it planes smoother than any other Pony Planer made. Also it uses less power.

Write for Prices and Catalogue

Elliot Machinery Co.

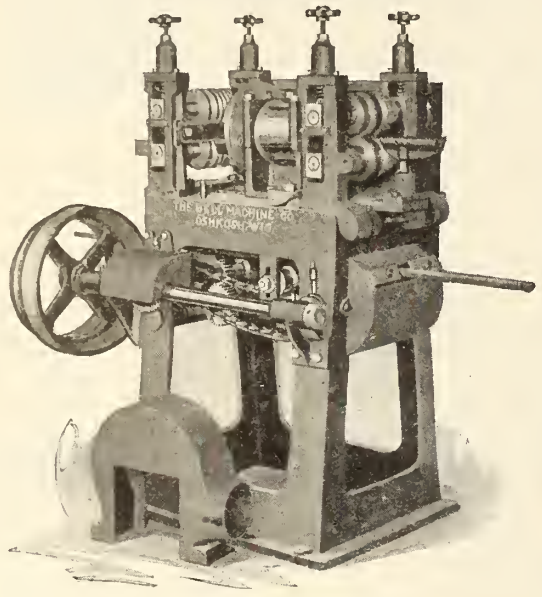
Limited

Belleville, - - - Ontario

CANADA

Make Your Own Dowels With the "BELL" Machines

The Fastest and Most Practical Equipment For the Purpose



Adjustable Rod and Dowel Machine

The fastest dowel machine in the world.

Constructed to withstand the heavy and constant strain to which this type of machine is subjected.

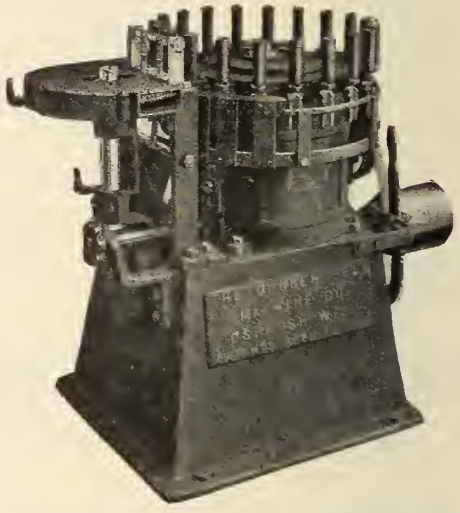
Equipped with a universal four-knife cutter head adjustable to turn rods of all diameters from ¼" to 2" in either plain, spiral groove, longitudinal groove, or imitation reed wind. Special machine for turning rods of larger size.

Cutter-head mandrel is mounted at each end in ball-bearings of the highest grade.

Out-going feed rolls have combination of grooves so that many sizes can be made without changing feed rolls. The in-going feed rolls are adjustable for all sizes of squares.

Will work stock as short as 4½ inches.

Furnished with countershaft or motor drive.



Dowel Cutting Off and Pointing Machine

This machine is for cutting off and pointing dowel pins from long rods.

It will cut and point dowel pins of all diameters up to ¾", and in any length up to 6 inches.

Capacity of this machine is from 300 to 400 pins a minute. Any boy can operate it.

All working parts are completely enclosed and thus protected from dust and dirt.

Absolutely no danger to operator.

The floor space required by this machine is only 22" x 36".

Tight and loose pulleys on machine.

Furnished with belt or motor drive.

MANUFACTURED BY

The Bell Machine Company

(Successors to the Dauber-Bell Machine Co.)

Oshkosh, Wisconsin, U.S.A.

Representatives:

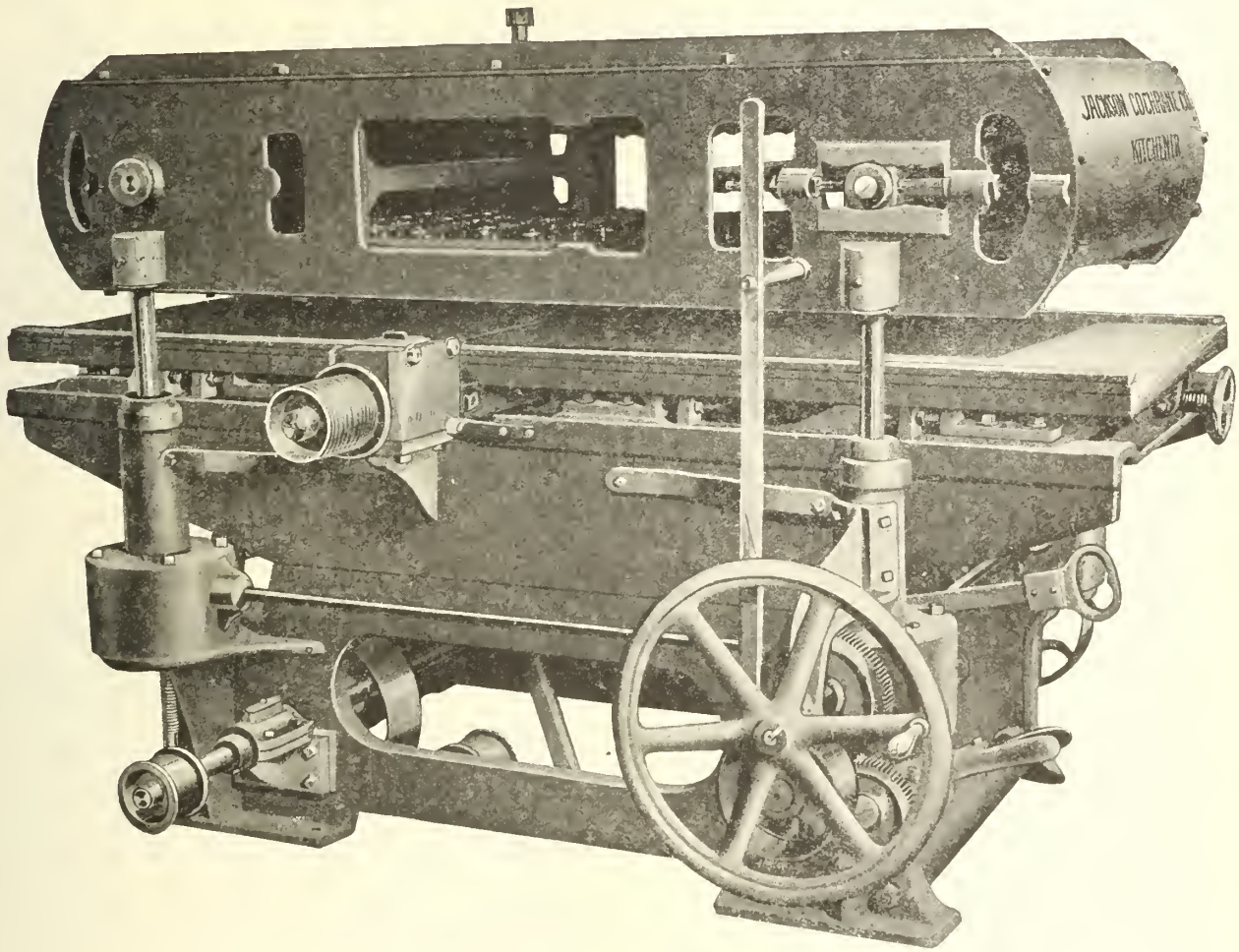
For Great Britain: THE OLIVER MACHINERY CO., 201 Deansgate, Manchester, England

For Canada: THE A. R. WILLIAMS MACHINERY CO. LTD., Montreal, Toronto, Winnipeg

"The Best Equipment Possible for the Work it is Intended to Do"

—*Says Panels, Limited*

of Southampton, Ont.



This machine not only increases production while lowering operating costs but entirely eliminates the dangers to which the operator of the old style buzz planer was subjected.

Just consider these facts:

It handles stock of any dimension, hard or soft, at four times the speed of the old method; occupies but one fourth the space required by four hand jointers; requires but one-fifth of the sharpening of the knives as the hand fed jointer and is easily operated by two boys.

These facts we shall be glad to prove to anyone interested in such a machine.

Jackson, Cochrane & Company

KITCHENER - CANADA

To Our Customers and Friends

and to everyone interested in the advancement and improvement of Woodworking Machinery in Canada along the lines of

"Greater Efficiency and Improved Quality"

WE extend a cordial invitation to visit our Booth in the Machinery Hall at the Canadian National Exhibition, where we will have on display a selected number of machines which we think will be worth your inspection and consideration and which we hope will prove to you our ability to handle any order which you might see fit to entrust us with in the future.

"Make our Booth your Headquarters"

Even if you aren't particularly interested in our Exhibit, come in and shake hands and rest yourself: We'll provide a comfortable chair. Leave your grip with us (with all due respect for its contents) while you do your sightseeing.

We'll be looking for you all and will hope not to be disappointed.

Sincerely,

The Preston Woodworking

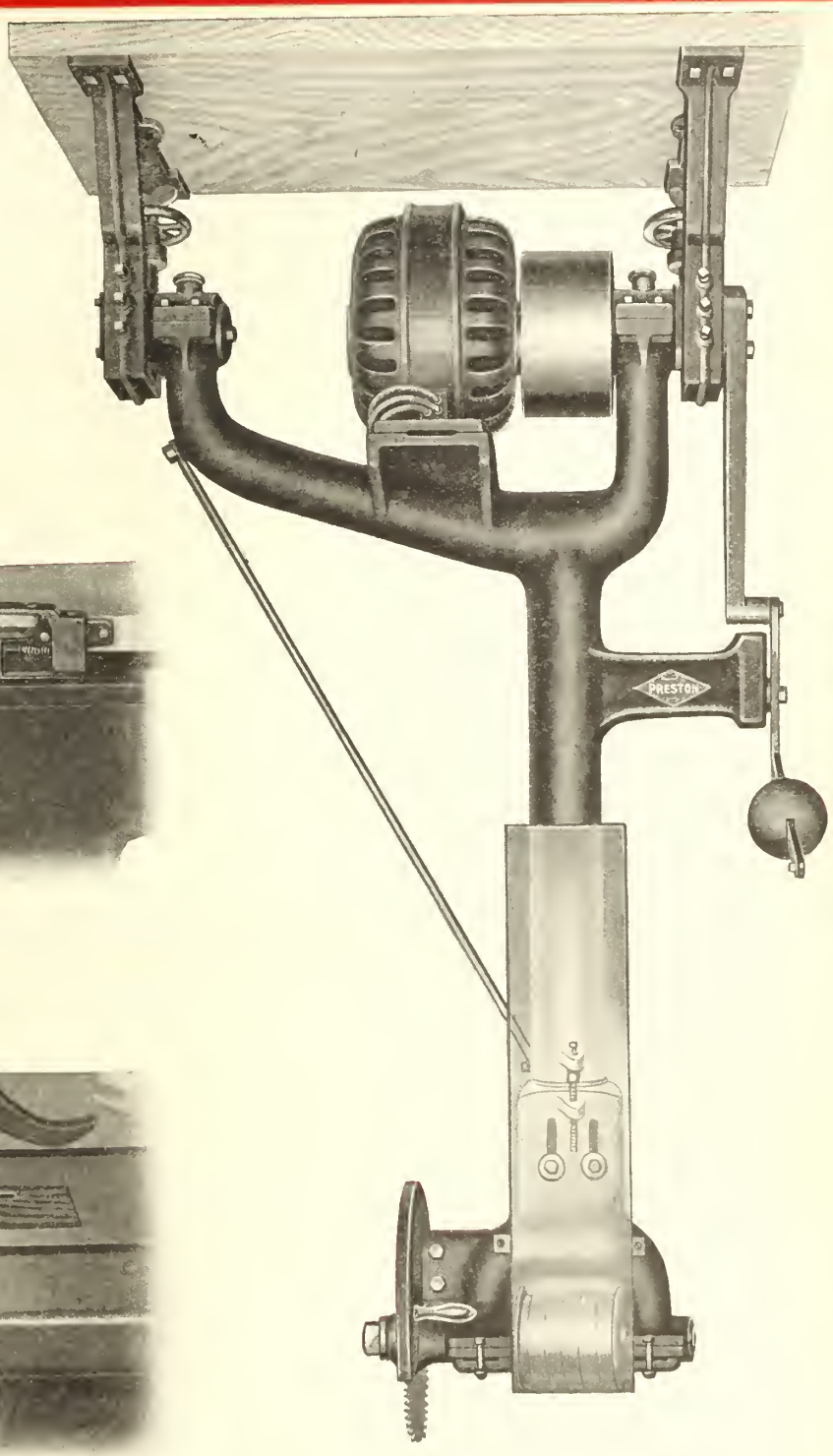
PRESTON,

We are Sole Manufacturers of and Agents in Canada for the Eaglesfield Patented Beltless Swing Saw

No. 152
reston" Motor Driven
Swing Cut Off Saw

(Note Belt Guard)

"Preston" Jointer Guard



Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

IF you plan to remodel your kiln, our literature will help you —also your operator.

What is a "Circulator?"
Do you know how it cuts down drying time—how it prevents checking? Ask for our free literature on this—it will pay you.

EVERY big new flooring plant built this year to dry hardwoods has chosen The Standard Dry Kiln except only one—consider what that means in the hardwood field.

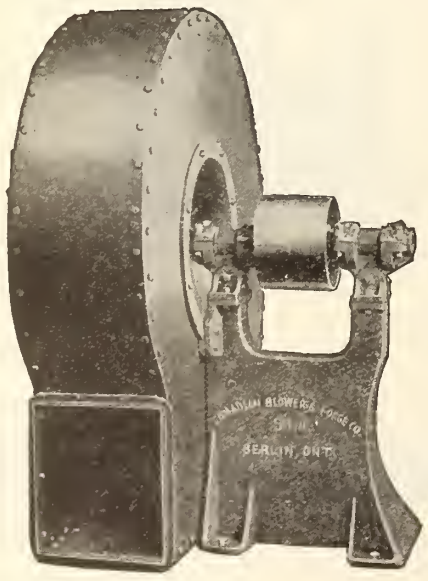
THE DRY KILN THAT DOES NOT Disappoint

The Only Heating System having ***both*** advantages—horizontal piping ***and*** also division into units.

Are you on our free mailing list? Get on—!

THE STANDARD DRY KILN

For literature on any points of drying or your problems, write us at 1542 McCarty St., Indianapolis—The Standard Dry Kiln Co.



Canadian Planing Mill Exhauster

Keep your shop clean, remove your sawdust, shavings, or other loose material.

A clean shop with machines free from shavings, chips or sawdust makes for greater efficiency.

Let our engineering department help you plan your refuse exhaust system.

Write for Catalogue 400-13

Canadian Blower & Forge Co.
KITCHENER, ONT.

Satisfaction at Home

Ontario and Quebec users of

National Kilns

say:

"We have just completed the second lot of lumber, dried in your new kiln and we are so delighted with the operation that we cannot refrain from writing to express our apreciation.

As you know, we have had several kilns in the past, of indifferent efficiency, and when this job was installed, we spared no expense in living up to the specifications demanded by you. The results have justified everything we have done, and we wish to say that we can heartily recommend this kiln to any prospective customer."—JAMES MALCOLM, President, THE ANDREW MALCOLM FURNITURE COMPANY, LTD., Kincardine, Ontario. (Manufacturers of Furniture.)

"We have no trouble in drying our lumber perfectly, in very short time, and with practically no waste in drying."—O. E. VARETTE, President, HILL-CLARK-FRANCIS, LTD., New Liskeard, Ontario. (Manufacturers of lumber, millwork and Builders' Supplies.)

"It gives me great pleasure to inform you that our NATIONAL kilns are working perfectly in every particular.

As you know, we have been operating our NATIONAL kilns for about three years, and we find them to be working better every day."—N. A. McLEAN, Supt. Body Plant and L. W. FERGUSON, Dry Kiln Operator, GENERAL MOTORS OF CANADA, LTD., Oshawa, Ontario.

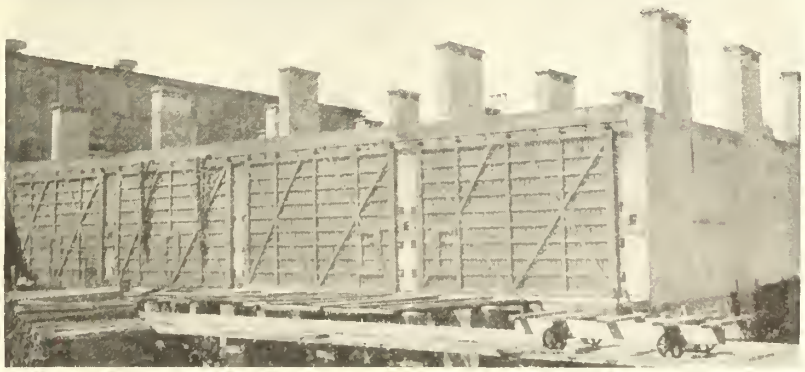
"In connection with your inquiry regarding the kiln that we had installed by you last winter, we beg to state that it is giving us perfect satisfaction and we have found it to do better work than your representative said it would in the first place.

We have been in the lumber business since 1869 and have tried a good many different types of kilns, and are getting better results from yours than from any we have had in the past."—W. T. PIGGOTT, WALTER T. PIGGOTT LUMBER COMPANY, Windsor, Ontario.

"It gives me pleasure to inform you that our NATIONAL KILNS are working perfectly, in every particular.

As you know, our kilns are equipped with all your automatic control devices, such as the automatic water supply tanks, dry bulb thermostat, wet bulb thermostat, scalometers, recording thermometers, door carriers, etc."—J. J. McINTOSH, Supt. RUBBERSET COMPANY, LTD., Gravenhurst, Ontario. (Manufacturers of brushes.)

"Nous devons aussi vous dire que nous sommes satisfaits de l'installation de notre nouveau sechoir."—G. A. ROY, Gerant, INTERPROVINCIALE, LTEE., St. Pie, Quebec. (Manufacturers of caskets.)



Why not follow their example and also be satisfied?

Why experiment?

The National Dry Kiln Company

1117 East Maryland Street Indianapolis, Indiana

or

C. A. FIELDS, Canadian Representative, P. O. Box 55, Toronto, Ontario

Alphabetical List of Advertisers

Adjustable Clamp Co. 107
Atlantic Lumber Company 50
Atkins & Co., E. C 123
Atlas Mfg. Co., of Orlando 109

Bachman Co., F. M. .....
Batavia Clamp Co. 96
Banning, Leland G. 53
Behr Co., Inc. Herman 33
Bigelow-Cooper Lumber Co. 51
Barr-Holaday Lumber Co. 39
Bell Machine Co. 8
Black Bros., Co. 111
Blocksom & Company 77
Bonner & Sons, J. H. 45
Bruce Woodworkers Ltd. 35
Bruce Company E. L. 53
Buffalo Hardwood Lumber Dealers 46
Bury & Co., Robt. 54

Calhoun Plywood Co. 36
Canada Machinery Corporation 19-20-21-22
Canada Wood Specialty Co. 50
Canadian Appraisal Co. Ltd., The 25
Canadian Blower & Forge Co. 12
Canadian General Lumber Co. 105
Canada Glue Co. 18
Canadian Powers Regulator Co. 15
Canadian Nashua Paper Co. .....
Canadian S. K. F. 115

Cannon Canadian Co., Ltd. 18
Connor J. H. & Sons Ltd. 50
Carborundum Co. 117
Carter & Co., E. T. 81
Casein Mfg. Co. 18
Celluloid Zapon Co. .....
Chapman & Dewey Lumber Co. 36
Clamp Nail Co. 107
Clarke Edward & Sons, Ltd. 48
Coiguet Chemical Products Co. 18
Colborn, C. B. 44
Comfy Cushion Co. 77
Cosmos Chemical Co. 25
Cowan & Co. 1
Cutler Desk Co. 15

Decorators Supply Co. 21
Delaney & Pettit Limited 78
Des Moines Sawmill Co. 40
DeVilbiss Mfg. Co. 82
Dominion Appraisal Co. 25
Doon Twines 78
Dry Kiln Door Carrier Co. 111

Eagle-Ottawa Leather Co. 76
Eaton & Sons, J. R. 43
Elliot Machinery Co. 7
Engineering & Machine Works of Canada Ltd. 120

Farrin Lumber Co., The M. B. 54
Fay & Egan Co., J. A. 2
Foster, Merriam Co. 26

Gardiner P. W. 14
Garlock Machinery Ltd. 3
General Machinery Co. 103
General Hardwood Lumber Co. 35
Globe Vise & Truck Co. 119
Grand Rapids Vapor Kiln 109
Guelph Patent Cask. Co., Ltd. 89
Gulf Lumber & Trading Co. 45

Hardwood Mfg's. Institute 32
Hafner Mfg. Co. 52
Hamilton Gear & Machine Co. .....
Hartzell, Geo. W. 41
Hay & Co. 97
Hay & Co., Peter 103
Hawker Mfg. Co., W. S. 29
Hoffman Bros., Co. 87
Hyde Lumber Co. 45

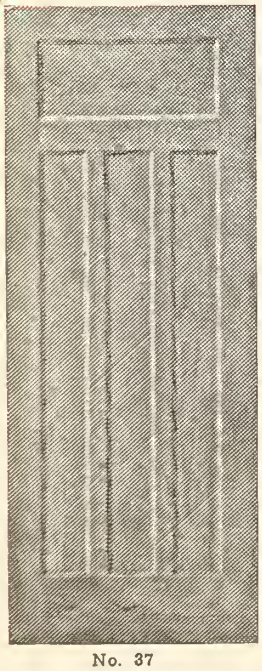
Ideal Fence & Spring Co. of Canada Ltd. 77
Industrial Engineering Co. 122

Jackson Cochrane & Co. 9

Kane Mfg. Co. 24
Kasebier Chatfield Shellac Co. 111
Kinnon Lumber Co., Ltd. 103
Klise Mfg. Co. 28
Klotz Machine Co. 33
Kosse, Shoe & Schleyer Co. 49
Kraetzer-Cured Lumber Co. 99

TRADE MARK

GARDINER DOORS
Are Good Doors


No. 37

Manufactured—

White Pine No. 1 and Paint Grades
Chestnut, Veneered Oak and Birch

In Stock Designs and Stock Sizes
(Big stock available for prompt shipment.)

High Grade Sash and Verandah Columns
Mouldings and Interior Trim in Clear
White Pine, Georgia Pine and Chestnut

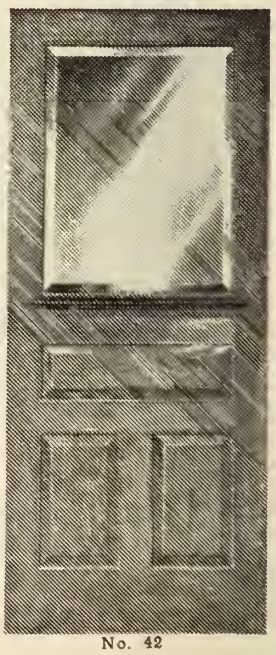
Our Motto—"Good Goods and Prompt Shipment."

ASK FOR CATALOGUE NO. 7.
(Please refer to this advertisement)

P. W. Gardiner & Son, Ltd.

Telephone 146

GALT - - ONTARIO


No. 42

The Economy and Efficiency of Kiln Temperature Control

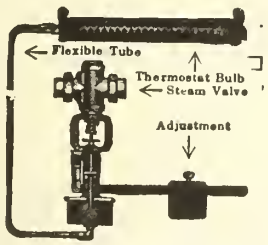
AN unvarying temperature in the Dry Kiln is of the utmost importance. Every inch of green wood has cost you real money and represents two values—raw value and finished value. Don't allow fluctuating kiln temperature to tamper with these values. Equip your kilns with

Powers Heat Regulators

As long as steam pressure is maintained Powers Regulators operate. Their operation insures correct kiln temperatures; saves fuel by using only necessary heat; saves labor by releasing men from watching thermometers and valves; saves material by cutting down the loss from case hardening, warping, and checking. Moreover, they also **Speed Up The Drying By Fully 25 Per Cent.**

Not An Experiment

"Play Safe." Install the Powers Heat Regulator—the product of more than thirty years of experience in Automatic temperature control. During our experience, we have gathered some very profitable information for the woodworking industry. Let us show you how to save money in your kilns, glue pots, drying rooms, hot water tanks, etc.

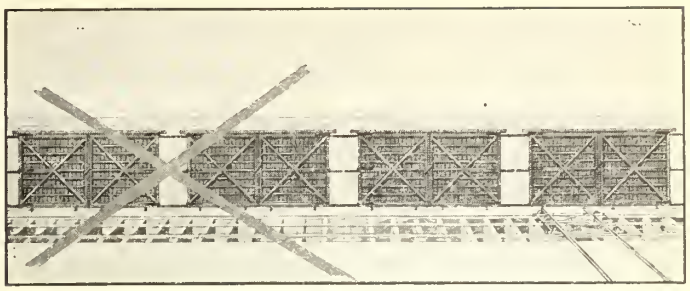


The Powers Regulator No. 15
Specially designed to control temperature in dry kilns, ovens, varnish and dry rooms, etc. Requires no outside power for its operation.

The Canadian POWERS REGULATOR Co. Ltd.
Specialists in Automatic Heat Control
82 Chestnut Street — Toronto, Ont.

Calgary, Alta. - Halifax, N.S. - Montreal, Que.
Vancouver, B.C. - Winnipeg, Man.

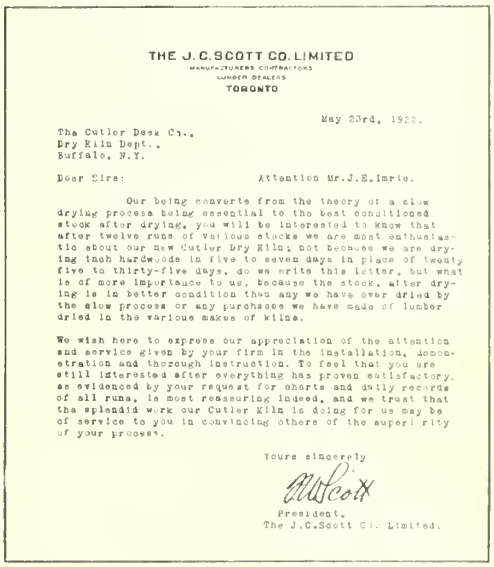
(1858)



2 Cutler Dry Kilns

Will produce as much dry lumber as 4 of any other kiln

THE new Cutler Dry Kiln is very greatly different from other kilns. It embodies a new and original principle (patented.) Its value to you is not only a two-to-one saving in installation cost, but a greatly improved quality of drying. Read Mr. Scott's letter.



THE J.C.SCOTT CO.LIMITED
MANUFACTURERS CONTRACTORS
LUMBER DEALERS
TORONTO

May 23rd, 1922.

The Cutler Desk Co.,
Dry Kiln Dept.,
Buffalo, N.Y.

Dear Sirs: Attention Mr.J.E.Imrie.

Our being converts from the theory of a slow drying process being essential to the best conditioned stock after drying, you will be interested to know that after twelve runs of various stocks we are most enthusiastic about our new Cutler Dry Kiln; not because we are drying inch hardwoods in five to seven days in place of twenty five to thirty-five days, do we write this letter, but what is of more importance to us, because the stock, after drying is in better condition than any we have ever dried by the slow process or any purchases we have made of lumber dried in the various makes of kilns.

We wish here to express our appreciation of the attention and service given by your firm in the installation, demonstration and thorough instruction. To feel that you are still interested after everything has proven satisfactory, as evidenced by your request for charts and daily records of all runs, is most reassuring indeed, and we trust that the splendid work our Cutler Kiln is doing for us may be of service to you in convincing others of the superiority of your process.

Yours sincerely
W.M.Scott
President,
The J.C.Scott Co. Limited.

A 35 ft. 1 car capacity Cutler Dry Kiln costs approximately $4200, complete, and has a yearly capacity of over a million board feet 4-4 hardwoods. Let us tell you how and why. Write or wire our Planning Engineer. Consult him for definite proposal. No obligation.

CUTLER DESK COMPANY
Dept. F. Buffalo, N. Y.

All essential features of Cutler Kilns are fully protected by mechanical and process patents granted and pending.

Cutler
DRY KILN
Better Drying in half the time

Alphabetical List of Advertisers—Continued

Ladlaw Bale-Tie Co. 109
Larson & Shaw Ltd. 111
Litton Veneer Co. 85
Liverpool Hardwood Co., Inc. .....
Long-Knight Lumber Co. 97
Luehrmann Hardwood Lumber Co. Chas. F.. 38

Marietta Paint & Color Co. 78
Mattison Machine Works 124
May Hardwood Co., R. R. 38
Maus, Chas. O. Lumber Co. 38
McDonagh Lumber Co. 36
McKenzie Machinery Co. 16
McKnight & Son Co., L. G. 122
Memphis Bandmill Co. 39
Memphis Veneer & Lumber Co. 87
Mercereau Hawkins Tie Co. 36
Merritt Engineering & Sales Co. 31
Minister of Finance 110
Mohawk Veneer Co. 87
Monite Glue 23
Morgan Machine Co. 121
Mowbray & Robinson 43
Murrelle Lumber Co., L. D. 45

Nash, J. M. 122
National Dry Kiln Co. 13
National Hardware Co. 109
National Patent Reed Sales Co. .....
Nichols & Co., A. S. 82
Northwestern Cooperage & Lumber Co. 85

Oakey & Sons, John 111
Ober Manufacturing Co. 107
Ohio Veneer Company 85
Oliver Machinery Co. 122
Oriental Textiles Co. .....
Otis Mfg. Co. 34
Overton, S. E. 28

Pedwell Hardwood Lumber Co. 47
Penrod-Jurden Co. 88
Penrod Walnut & Veneer Co. 88
Perkins Glue Co. 17
Petrie Ltd., H. W. 119
Pettingell Machine Co. 103
Pickrel Veneer Co. .....
Porter Machinery Co., C. O. .....
Preston Woodworking Mach. Co. 10-11
Purcell Walnut Lumber Co., Frank 42

Radcliff Saw Mfg. Co. 123
Reese-Sheriff Lumber Co. 49
Reynolds Machine Co. 108
Richards Hardwood Co. 35
Richards-Wilcox Canadian Co. 103
Rush Lumber Co. 43

Shantz, P. E. 33
Shimer Cutter Head Co. 7
Shurley Dietrich C. 4
Sidmans of Canada The 105
Simonds Canada Saw Co. 113
Smith Lumber Co., Payson 38
Sondheimer Co., E. 51
Standard Dry Kiln Co. 12
Standard Veneer Co. 87
Stark & Co., Jas. E. 42
Steels & Hibbard Lumber Co. 42
Stimson & Co., J. V. 44
Stimson Hardwood Co., J. V. 37
Stimson Veneer & Lumber Co. 37
Sturtevant Co., B. F. 31
St. Joseph Iron Works 121

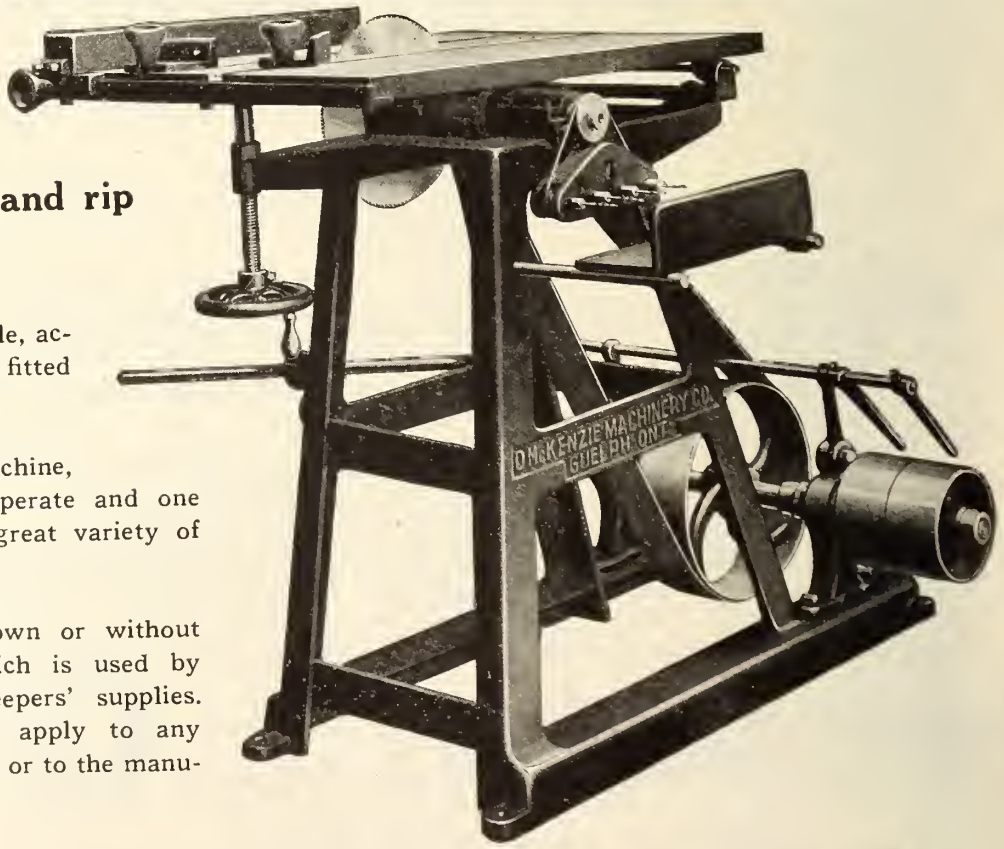
Taylor Mfg. Co., Jas. L. 108
Toronto Veneer Co. 95
Toronto Hardwood Lumber Co., Ltd. 95
Turner-Farber-Love Co. 101

Valley City Machine Works 30
Veneer Manufacturing Co. 89

Waddell Mfg. Co. 28
Walter & Sons, J. 27
Watertown Table-Slide Co. 33
Wayne Lumber Co. 44
Willey Co., C. L. 93
Williams Machinery Co., A. R. 6
Williamson Veneer Co. 90
Wisconsin Veneer Co. 85
Wood Mosaic Co. 91
Wylie Mathew 6

Yates Machine Co., Ltd. P. B. 4-5
Yellow Poplar Lumber Co. 52
Young Lumber Co., Bedna 44

McKenzie



Cross-cut, mitre and rip Saw No. 2

All iron frame and table, accurately machined and fitted insuring good work.

A light inexpensive machine, handy and simple to operate and one which will turn out a great variety of work.

Sold complete as shown or without drilling attachment which is used by manufacturers of beekeepers' supplies. For further particulars apply to any reliable machinery dealer or to the manufacturers.

D. McKenzie Machinery Company, Guelph, Ont.

PERKINS
183
Trade Mark
Reg. U.S. Pat. Off.

OF COURSE YOU KNOW

General Office and Factory

"QUALITY" if applied in its truest sense to a vegetable glue means a combination of quality workmanship plus quality materials. The best materials produced could be present in the glue, yet it might cause all sorts of trouble in plywood construction, due to the absence of that skill in manufacturing which can only come from years of vegetable glue making experience.

PERKINS 183 represents years of progress by the organization which discovered vegetable glue. Time always has been the deciding factor that proves the ability of a manufacurer to produce a dependable product that will enable the consumer to realize a maximum return for his investment.

Patents covering Perkins Glue have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office
South Bend, Indiana

WATCH FOR THE BULL DOG

UNIFORMITY

When used in describing a **Cannon Glue** is more than a claim. It is an established **fact!**

We have customers in Canada who have used one brand for fifteen to twenty years without one cause for complaint.

CANNON CANADIAN CO., LTD.
TORONTO **MONTREAL**

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

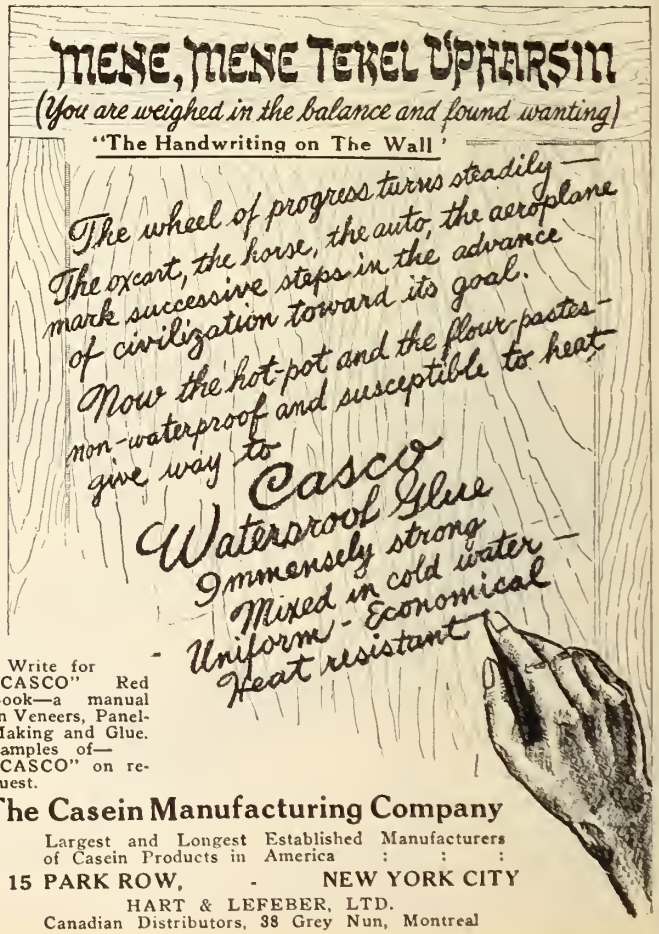
Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY
17 State Street NEW YORK CITY


MENE, MENE TEKEL UPHARSIN
(You are weighed in the balance and found wanting)
"The Handwriting on The Wall"
The wheel of progress turns steadily —
The oxcart, the horse, the auto, the aeroplane
mark successive steps in the advance
of civilization toward its goal.
Now the hot-pot and the flour-paste —
non-waterproof and susceptible to heat
give way to
Casco
Waterproof Glue
Immensely strong
Mixed in cold water —
Uniform - Economical
Heat resistant

Write for "CASCO" Red Book—a manual on Veneers, Panel-Making and Glue. Samples of—"CASCO" on request.

The Casein Manufacturing Company
Largest and Longest Established Manufacturers of Casein Products in America
15 PARK ROW, - NEW YORK CITY
HART & LEFEBER, LTD.
Canadian Distributors, 38 Grey Nun, Montreal

A little talk on

Langslow Limited

and the

Rice Lake Canoe Company

at Cobourg, Ont.

The Langslow Limited Plant

C.M.C. $33,000 Worth o

In The Canada Machinery

IT is to be conceded that a firm with the long and successful experience in furniture manufacture that has be the lot of the Langslow-Fowler Company of Rochester, N.Y., must know good machinery. If they did no is questionable if they would have attained the position in the trade which they now enjoy. They possi would not have been prepared to build and equip the splendid Canadian branch factories which they now op ate at Cobourg, Ontario.

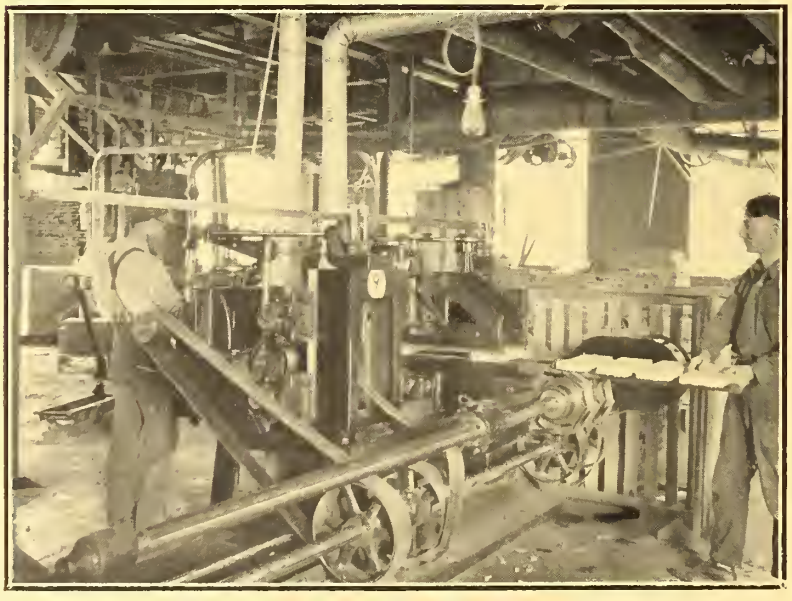
Langslow's do know good machinery. They have on their staff competent, critical and practical men u whose advice the equipment for their Cobourg factories has been purchased.

Considering this, we feel gratified to be able to refer to these two practically entire equipments of new C.M machines selected by them after the most painstaking and comparative investigation. Nothing but the b would suit them and in C.M.C. machines they found it. It is the more flattering to us when we consider the ini installation in the Langslow Limited plant which was ordered during the autumn of 1920 gave such excell service that when it was necessary for them to increase their production and to equip their newly erected "F Lake Canoe" plant in the fall of 1921, they came directly to us to fill their new requirements. "The proof of pudding was the eating."

All machines listed are giving excellent satisfaction and we are proud to say that we can confidently r you to Langslow, Limited, as to the performance of any one of them.

The illustrations of these two pages show a few of the principal machines in actual operation.

Some of the other machines installed in these plants are shown on the last page of this advertisement.



No. 500 Double End Tenoner

Machines used in the Langslow Limited Plant

No. 611—Straight Edger.
400—42" Rev. Bed Sander.
708—48" Band Resaw.
218—30" Cabinet Planer.
916—Single Spindle Borer.
803—Ball Bearing Shaper.
617—Variety Saw.
714—36" Band Saw.
818—Continuous Feed Glue Jointe
433—Hand Block Belt Sander.
500—Double End Tenoner.

CANADA MACHINER

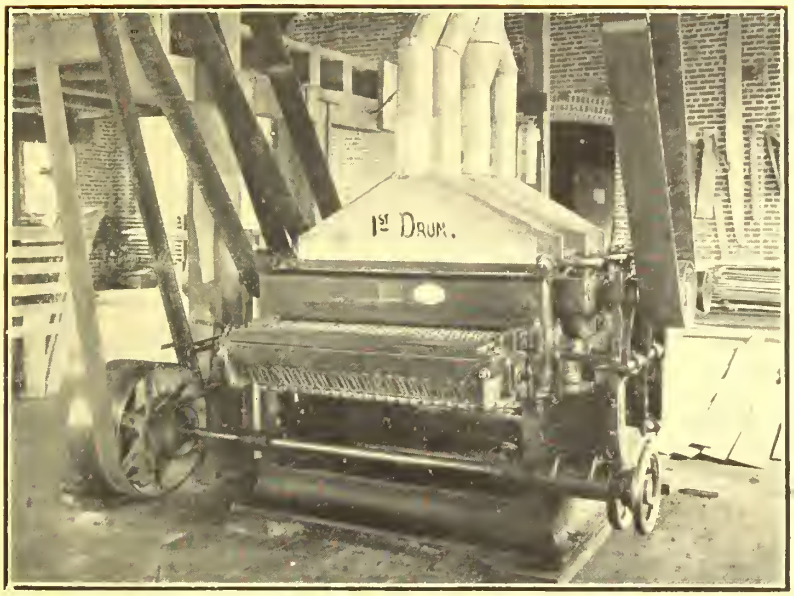
GALT,

onfidence

Corporation

n the Rice Lake Canoe Plant

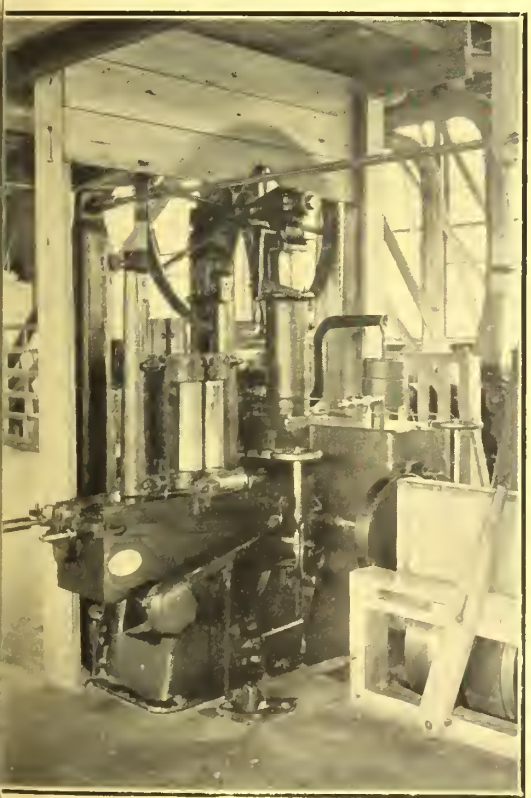
- o. 400—42″ Rev. Bed Sander.
- 611—Straight Edger.
- 216—26″ Double Surfacer.
- 648—Swing Saw.
- 617—Variety Saw.
- 433—Hand Block Belt Sander.
- 551—Chain Saw Mortiser.
- 826—12″ Buzz Planer.
- 805—Ball Bearing Shaper.



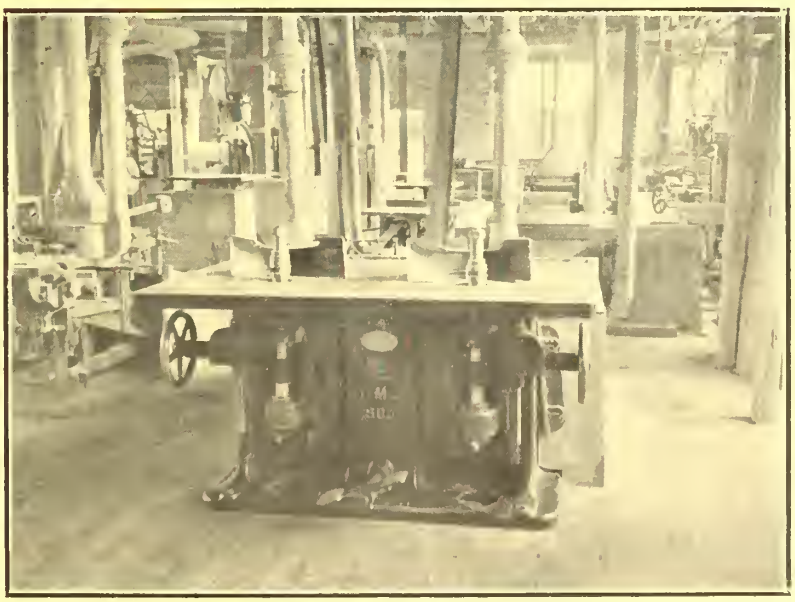
No. 400 42″ Revolving Bed Sander

C.M.C.

This registered trademark is a guarantee to you as it was to Langslow Limited, of the high quality of C.M.C. Machines.



No. 708 48″ Band Resaw

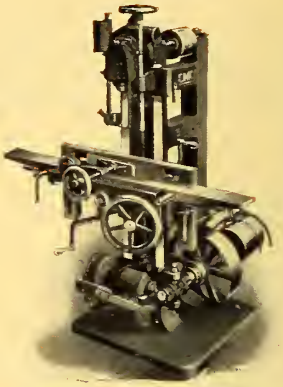


No. 805 Double Spindle, High Speed, Ball-Bearing Shaper

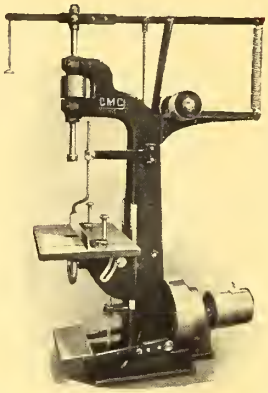
CORPORATION LIMITED

ONTARIO.

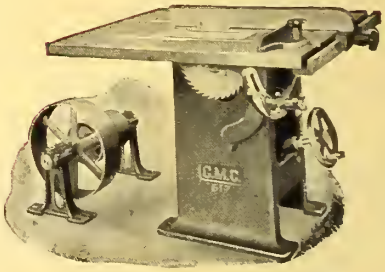
Some of the other machines in use in *The* Langslow Plant *at* Cobourg, Ont.



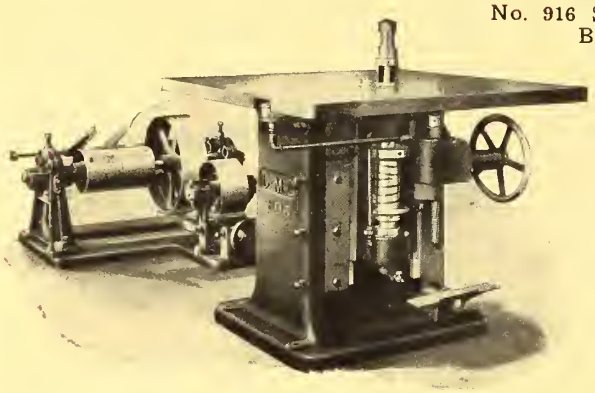
No. 551 Chain Saw Mortiser



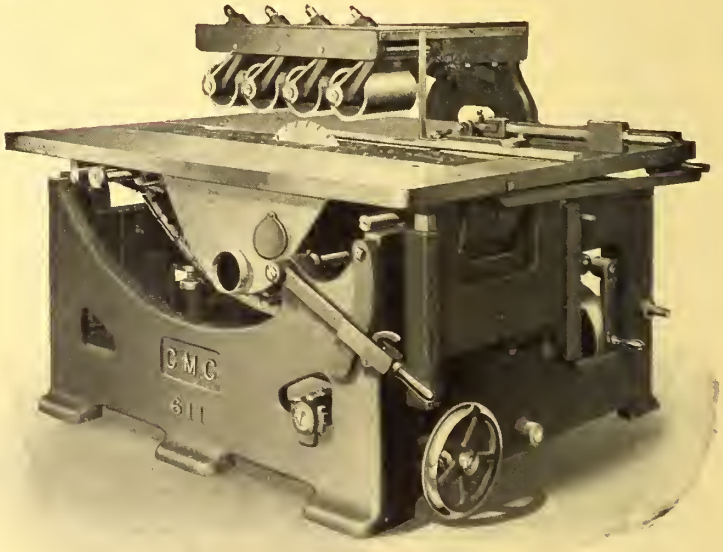
No. 916 Single Spindle Vertical Boring Machine



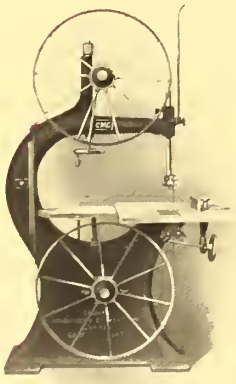
No. 617 Variety Saw



No. 803 Single Spindle, High Speed Ball Bearing Shaper



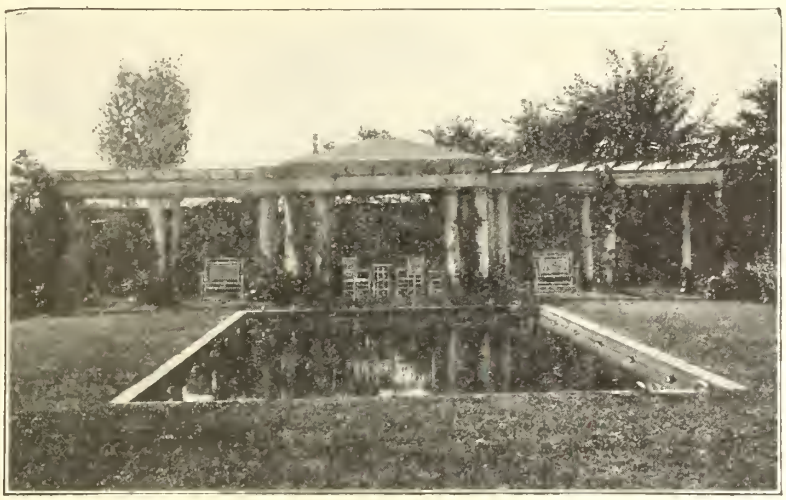
No. 611 Straight Edging and Jointing Saw



No. 714 36" Band Saw

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721 Bank of Hamilton Building



Pergola and lattice-work trellis on a country estate near Aurora, Illinois.
Monite Water-proof Glue used exclusively

MONITE Waterproof Glue

Is used wherever durability and permanent beauty are demanded. Boil it, bake it, soak it or freeze it—

MONITE STICKS TO ITS JOB.

All Outdoor Work Glued With MONITE

"The staves of all columns, their caps and bases, and all exterior work produced by us is put together with cold water waterproof glue"—p. 4, Catalog No. 47, Hartman-Sanders Co., Chicago and New York.

And that "cold water waterproof glue" is Monite Waterproof Glue—adopted after thorough tests of other glues, for exclusive use.

The Hartman-Sanders Company of Chicago and New York, builders of the famous Koll's Patent Lock-Joint Staved Wood Columns, veneered columns, porch materials, lattice work, art fences, pergolas and garden furniture find Monite Waterproof Glue a necessity for maintaining the beauty that they build into their work.

From New England to the Hawaiian Islands, the Hartman-Sanders Company have added their architectural adornments to notable public buildings like the Old Lyme Church in Connecticut, the Moana Hotel, Hawaii—and to beautiful residences and estates like that of E. J. Lehmann at Lake Villa, Illinois.

From porch and pergola to garden seat, all the Hartman-Sanders exterior work uses Monite Waterproof Glue exclusively. And their work is much sought after by architects and builders for it combines beauty with permanence.

Monite Waterproof Glue withstands all exterior weather conditions, rain and fog, zero, blizzards or blistering sun. It is equally effective for interior woodwork or furniture, enduring extremes of heat and cold or dry and damp.

Manufacturers, builders, dealers, or housewives who have had trouble with loosened glue joints or veneer with any form of furniture or mill work should write for the Monite story. An interesting vest-pocket panel of plywood glued with Monite will be sent free.

Boil it, bake it, soak it or freeze it—Monite sticks to its job.

MONITE WATERPROOF GLUE CO.

MANUFACTURERS OF COLD GLUE IN POWDERED FORM

1628 N. 2nd Street MINNEAPOLIS, MINN.

Canadian Representatives:

W. H. CUNNINGHAM & HILL, LTD., 269 Richmond St., W., TORONTO, CANADA

STOCKS AND REPRESENTATIVES IN ALL PRINCIPAL CITIES.

KANE VEGETABLE GLUE

We never cheapen the quality of our product in order to make low prices that cannot pay for first quality material and work.

Also

Kansine Waterproof Glue

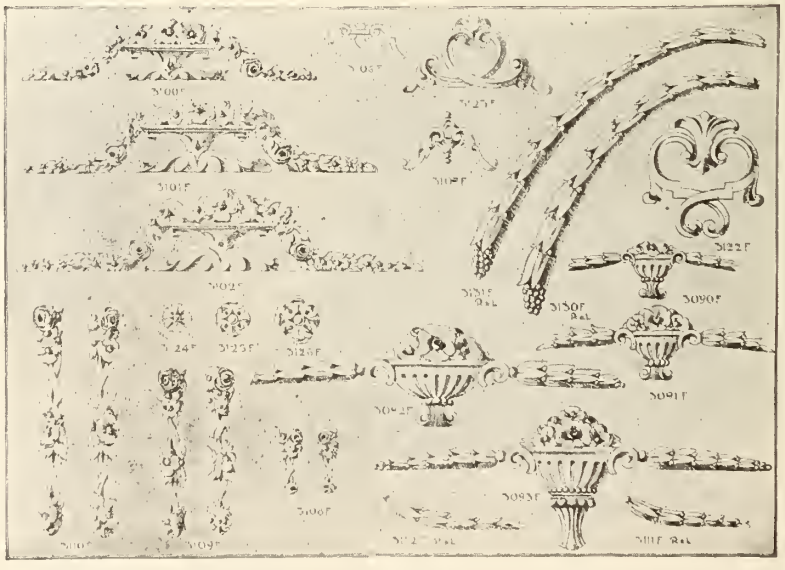
Manufactured exclusively by

KANE MANUFACTURING CO.

1832-34 South Clark Street CHICAGO, ILL.

PERIOD CARVINGS *for* FURNITURE

Largest Manufacturers of Imitation Wood Carvings in the World Quality the Best. Prompt Shipments



Unlimited Facilities for Manufacturing High Grade Wood Carvings in Composition and Wood Fibre

Reproductions of Exclusive Designs Our Specialty

THE DECORATORS SUPPLY CO.

2543 ARCHER AVENUE, CHICAGO

New Catalog Sent on Request

A Better FINISH

You can improve the appearance and durability of your finishes and increase the saleability of your furniture by using

Cosmos High Grade Lacquers and Lacquer Enamels

Lacquer gives a permanent, waterproof surface that is tough and durable.

It dries rapidly, increasing the output of the finishing department. Successive coats may be applied at half-hour intervals, enabling work to be finished in one day.

Samples, prices and other particulars gladly furnished.

Our Specialties:

METAL LACQUERS
WOOD LACQUERS
ENAMELS
BRONZING LIQUIDS
EUREKA AIR BRUSHES
AMYL-ACETATE
REFINED FUSEL OIL
COLLODION
BRONZE POWDERS
MATCHLESS METAL POLISHES AND BUFFING COMPOSITIONS
BANANA OIL

Cosmos Chemical Company
Port Hope Ontario

The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5.000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

Dominion Appraisal Company Limited

The Test of An Appraisal

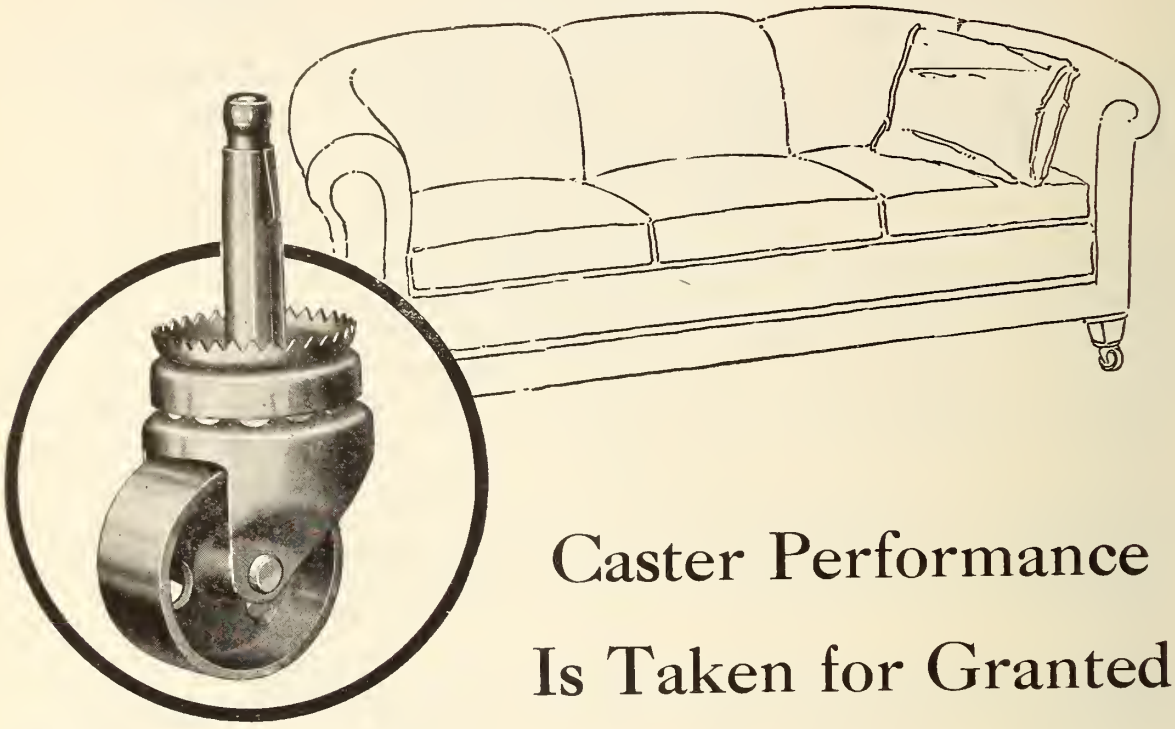
"We have never been so grateful for anything we have done as for the appraisal made by you in December 1919. It certainly was worth thousands of dollars to us in the adjustment of the fire."

Port Arthur Daily News Limited
May 5th, 1921

Our staff of qualified appraisers—men with many years experience in the appraisal field—and our system of careful supervision of all work entrusted to our care has afforded protection to our large clientel extending throughout the Dominion of Canada.

We solicit your correspondence

8-10 Wellington Street East
TORONTO, ONT.
Telephone Main 646.



Caster Performance Is Taken for Granted

Casters show their great importance least when working well. They attract little attention while they perform perfectly.

But the casters are there, working every time the piece is moved. Hence the need of dependable equipment.

If they are efficient, well-built casters like **Efemco** you will scarcely be aware of their presence.

Efemco Casters will give lifetime service wherever they are applied and there is a kind designed for every use.

Acme Grip Neck and Plate Casters
Atlas Plate Roller Bearing Casters

Send for our latest catalog

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

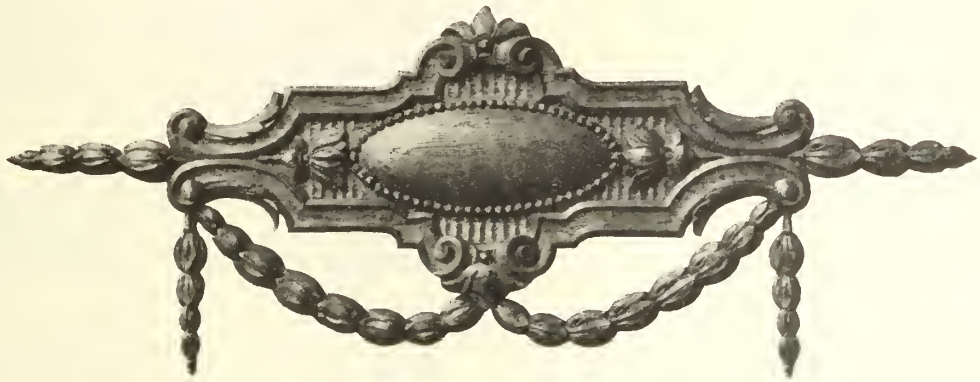
Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters
Roller Bearing Casters

Washing Machine Casters
Truck Casters

Piston Rings
Grey Iron Castings
Automobile Accessories

Standardized by 87 years of service



Fibro Wood Carvings are what the name implies. They are in short a wood product largely constructed of wood pulp and are really not an imitation, but rather an achievement in themselves.

Fibro Wood Carvings do not deteriorate, check or chip; are reliable and serviceable. Your furniture decorated with Fibro Wood Carvings stays sold.

JOHN WALTERS & SONS LIMITED

KITCHENER :-: ONTARIO

S.E.OVERTON CO.
Our Quality Is Always Higher Than Our Price
ARTISTIC WOOD CARVINGS

WE specialize in the manufacture of high grade wood carvings, wood turnings and specialties.

Our highly skilled organization and improved equipment permit us to produce highly finished carvings in any quantity, promptly and economically.

Our prices are satisfactory—write for them.

S. E. OVERTON
COMPANY
SOUTH HAVEN
MICHIGAN U.S.A.

CARVED MOULDINGS, CARVINGS, CARVED LEGS

No. D-775 (Reduced One-Half)

No. D-763 (Reduced One-Half)

"KLISE" mouldings are carved, not pressed. Made in several hundred classic, period designs, in various sizes and shapes.
Catalogue of legs and samples of mouldings sent on request. Send us your designs or samples of carvings for quotation.

KLISE MANUFACTURING COMPANY
Grand Rapids, Michigan

M 97

M 88

M 77

M 91

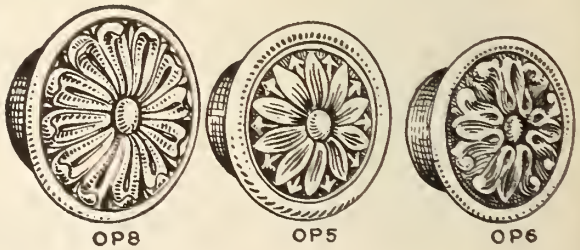
M 72

M 73

MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

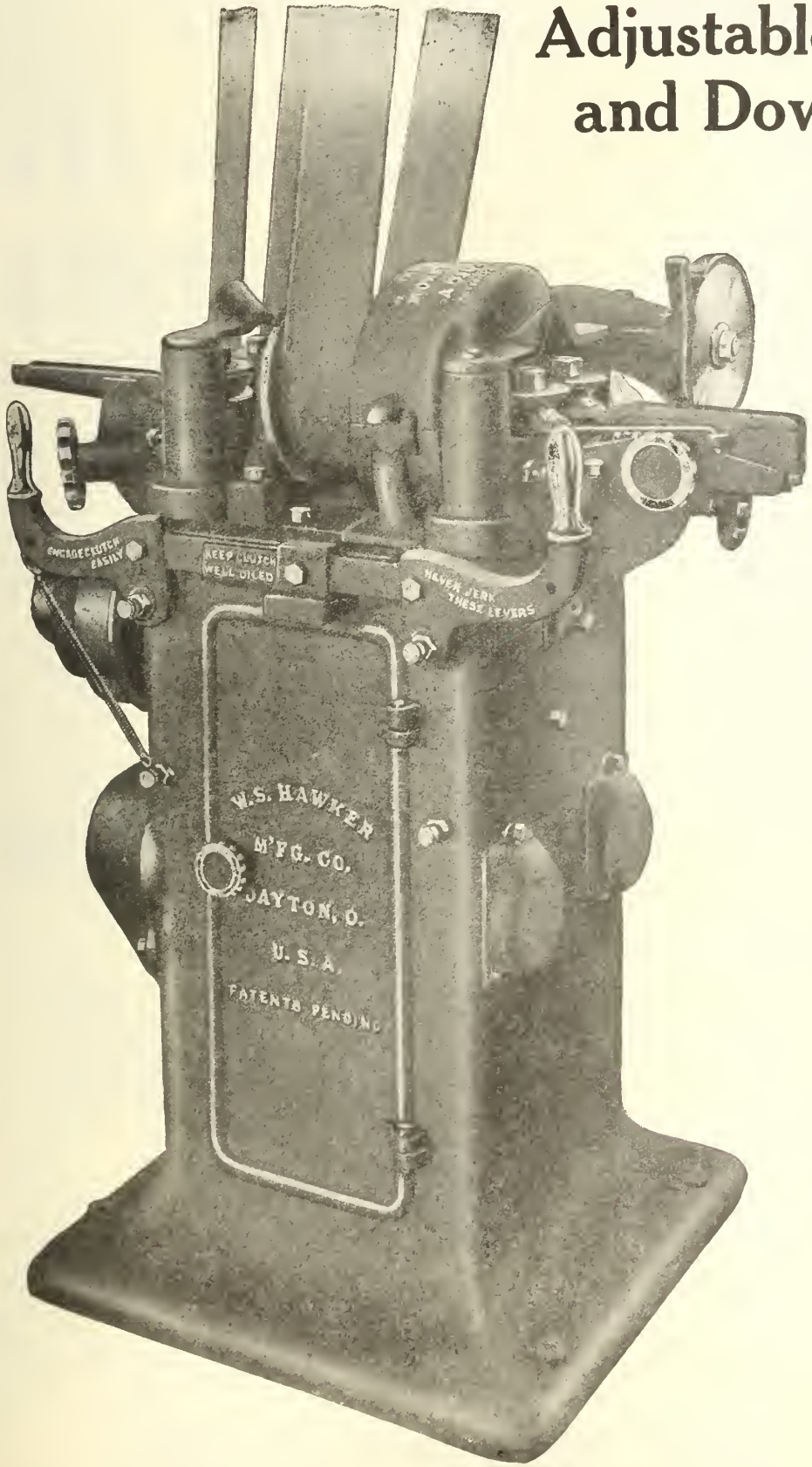
ROSETTES A new Period item to accompany the knobs.



OP8 OP5 OP6

Waddell Manufacturing Company
Coldbrook and Taylor, N. W. Grand Rapids, Mich.

The Money Maker— Adjustable Rod and Dowel Machine

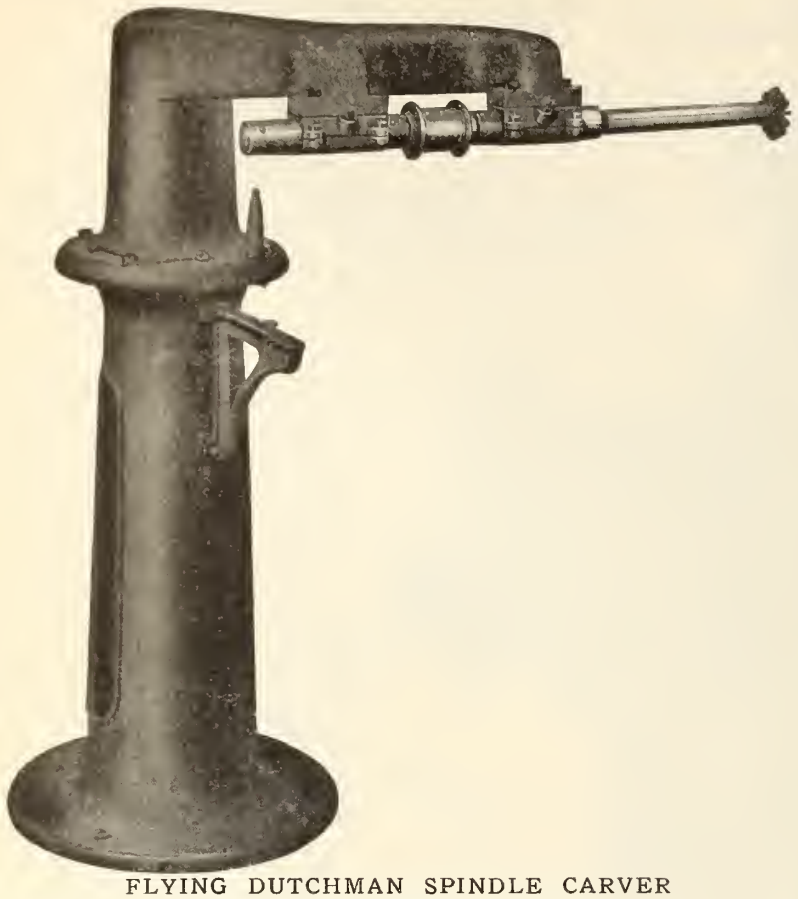


Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely
Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio

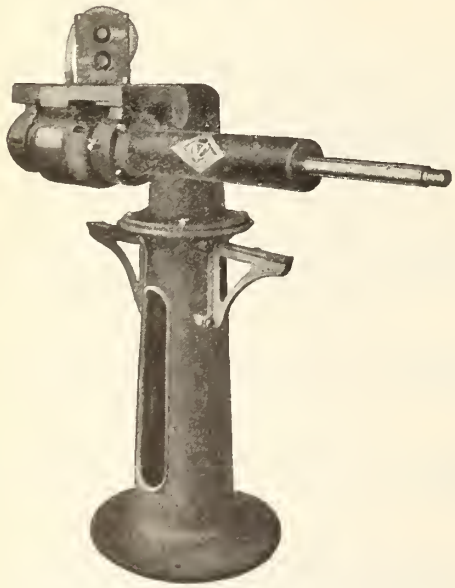


FLYING DUTCHMAN SPINDLE CARVER
Plain or ball bearings as desired.

Spindle Carving
Modernized

Valley City Spindle Carvers built twenty five years ago are still doing service in many plants—discriminating manufacturers have always preferred them. We present the very latest developments in this line. The modern spindle carver is a production tool, and is designed to cover a wide range of light and heavy work.

Shall we send complete information?



FLYING DUTCHMAN SPINDLE CARVER
Fitted for direct motor drive—ball bearings—note supplementary spindle bearing.

HIGH DUTY SPINDLE CARVER
Fitted for direct motor drive or belt drive as desired—ball bearings—note supplementary overarm bearing. Weight of this machine 1,300 lbs.

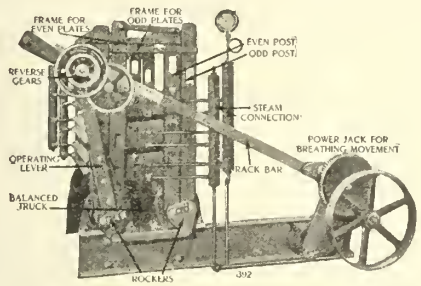
Valley City Machine Works

Campau Ave. and Fulton St. N W. - Grand Rapids, Michigan, U.S.A.

MERRITT ENGINEERING AND SALES COMPANY LOCKPORT N.Y.

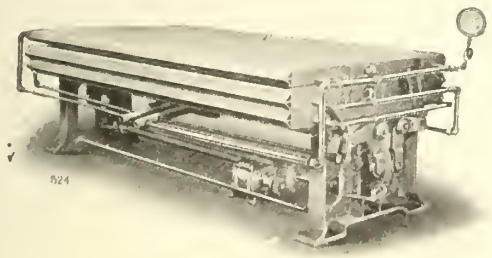
MESCO

It Pays to Install a "Merit" Re-drier



Bulletin No. 70-C.W.

Re-drying was not practiced to any extent 15 years ago when the "Merit" re-drier made its appearance on the market. Today very few glue rooms take a chance on veneer that has not been re-dried under hot plates and very few plants using veneer have neglected to install a "Merit" re-drier. This machine flattens the veneer and makes it absolutely bone dry. It takes very little steam and is operated by a 2 h.p. motor. It saves glue, simplifies taping and jointing and insures success in the finished product. It is made in several sizes of plate and starting with 4 plates, a machine can later be expanded to 12 or 16 plates.



The Three Plate Re-drier

The "Merit" Line

Veneer Lathes, Clippers, Driers and Re-driers

Plywood and Panel Machinery

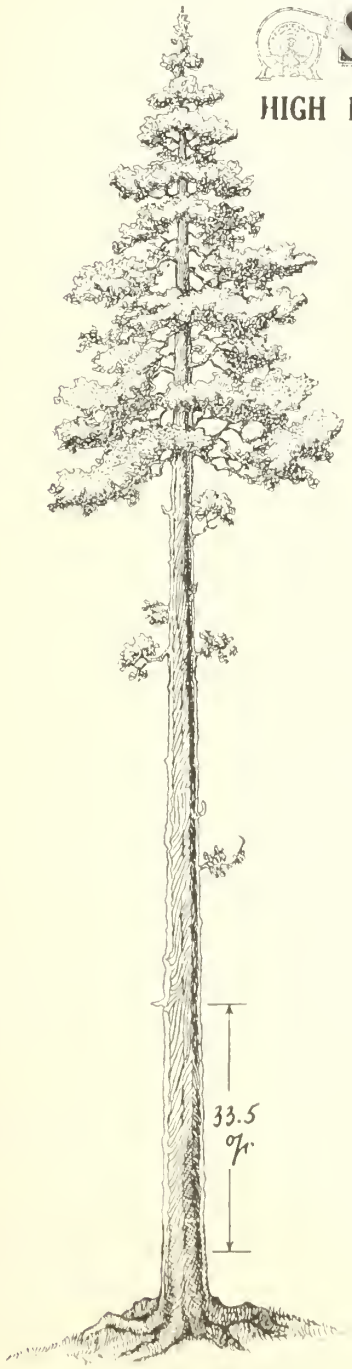
Basket and Crate Machinery

MERIT

You can lessen this waste

The Government Forest Service tells us that only 33.5 percent of the log is converted into merchantable lumber. Further that 16.3 percent is lost in subsequent manufacturing operations, leaving only 17.2 percent of clear cuttings for the manufacturer.

With a correctly operated.



Sturtevant
PUTS AIR TO WORK

HIGH HUMIDITY DRY KILN

The Kiln with the circulation you can understand.

there is no checking, warping, cracking, casehardening or honeycombing.

Consequently there is little or no waste. Because of this and the confidence they have in results, some concerns put their lumber in a STURTEVANT KILN already cut to size.

But there is more about Sturtevant Kilns in Bulletin No. 282. Write for your copy today.

B. F. Sturtevant Co. of Canada

Montreal, Galt, Toronto

Territorial Representatives

Empire Engineering & Supply Co.
Edmonton, Alberta

Kip-Kelly, Limted
Winnipeg, Manitoba

662

A Statement

by the

Hardwood Manufacturers' Institute

to all

Users of Hardwood Lumber

We are in position to help you cut your material and labor costs—definitely, intelligently and permanently.

The biggest "profit eater" in your business and ours is WASTE. As a matter of Public Service, in which is bound up our individual advantage and legitimate profit, we are carrying still further forward a sound policy of WASTE ELIMINATION.

This policy in our own production is the beginning of its application for your advantage to YOUR PRODUCTION PROBLEMS.

In a word, we can and will hook our production closer to your needs on the basis that, though you are buyers and we are sellers, there is a common interest which we both must serve. That is the interest of the twenty-one million families in the United States who spend some forty-five billions of dollars annually that PAYS EVERYBODY FOR EVERYTHING.

Insead of your buying a stated quantity of certain grades and sizes, and including the labor and material waste as inevitable burdens, let us counsel together so that we can make our product fit closer to your needs.

There are tremendous changes at work in all lines of business—so far-reaching that most men do not yet appraise their power and extent.

This power was as inevitable as the tide—and is just as resistless. We of the hardwood manufacturing industry of America are at the forefront of this new swing in business, for we realize clearly that only by the utmost service in addition to the production of the best possible Hardwood lumber can we assure the stability, progress and prosperity of our industry.

Because your interests and ours tie in closely on this basic principle, we offer our services and invite you to counsel with us in arriving at the best kind, grade and size of hardwood that will best meet your needs for specific purposes.

THIS OFFER AND INVITATION IS BASED NOT ON A THEORY OR A "HOPE" BUT UPON THE GROWING PROOFS THAT ARE THE RESULT OF OUR ACTUAL WORK. IT IS BEING ACCEPTED IN A RAPIDLY MULTIPLYING NUMBER OF CASES AND, WHEREVER IT IS TRIED IT CUTS COSTS, SAVES WASTE AND INSURES ECONOMIES.

WE INVITE FRANK CORRESPONDENCE AND ARE PREPARED TO RESPOND PROMPTLY, CANDIDLY AND WITH PRACTICAL HELPFULNESS IN EACH INDIVIDUAL CASE.

Hardwood Manufacturers' Institute

25 Quincy Street, Chicago

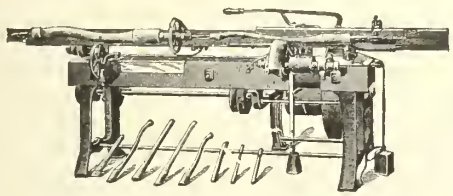
Are You Using
Roller-Bearing Equalizer Table Slides?

These are the most smoothly operating slides on the market. Give absolutely no trouble at all. Let us send you prices and full particulars.

WATERTOWN TABLE - SLIDE COMPANY
Watertown, Wisconsin, U.S.A.

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.
We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY
Klotz Machine Co.,
Sandusky, O., U. S. A.
Write for descriptive circulars and prices.

Behr's Garnet Cloth Standard for Belt Sanders

The backing is made practically stretchless, by a special finishing process, exclusive with us.

The glue is the most suitable obtainable—its cost is a secondary consideration.

Garnet kernels—clean, hard, sharp and evenly graded—are applied in just the correct volume to give the fastest, smoothest and longest cut possible.

These are the qualities that have made Behr's Garnet Cloth the standard for thirty seven years.

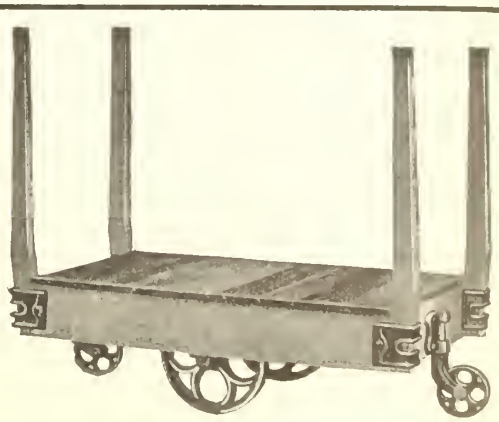
Samples for trials on your own work sent without charge; please specify grades, width and weight of backing desired.

HERMAN BEHR & CO., INC.
31-63 Tiffany Place Brooklyn, N. Y.
Toronto: 361 Sorauren Ave.
1872 *Pioneers in the Improvement of Sandpapers for 50 years* 1922

FACTORY TRUCKS

Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY
P. E. SHANTZ, PRESTON, ONTARIO.



Factory Truck Style No. 26.

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

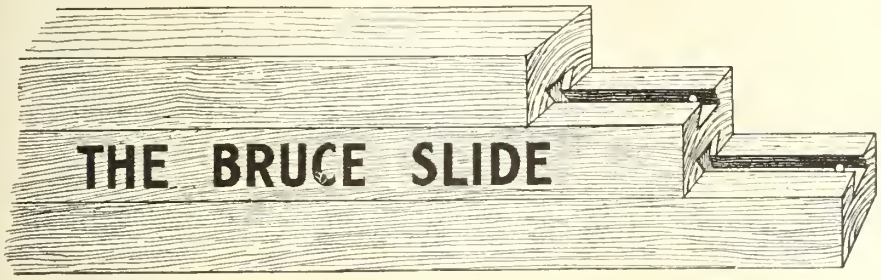
Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

TABLE SLIDES TABLE RIMS TABLE PINS



Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

H. J. RICHARDS J. T. KENDALL

Richards Hardwood Company

746-7 BANK OF COMMERCE BUILDING

Memphis, Tennessee, U. S. A.

Successors to Dacus-Richards Hardwood Co.

We make a specialty of catering to the Canadian trade and are in position to make reasonably prompt shipment of practically any Southern Hardwoods which you are needing. Your orders and inquiries will be highly appreciated and will receive our prompt and personal attention.

Specializing in Delta Red and Sapgum, Oak, Elm and Poplar.

GENERAL HARDWOOD LUMBER COMPANY

SOUTHERN AND NORTHERN HARDWOODS

118 North La Salle Street

CHICAGO

Quick shipments assured, together with quality stocks.

Kindly favor us with your enquiries.

Mercereau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

Calhoun Plywood Company

Panels Tops Counter Fronts

OPERA CHAIRS
in the White or finished.

Vegetable or Waterproof Glue.

Sheboygan - Wisconsin

McDonagh Lumber Co.

203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods
Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

From Tree to Consumer

For nearly thirty years the Chapman and Dewey Lumber Company has cut the timber from its own hardwood lands in the famous St. Francis delta region of Arkansas, sawn it in its own mills and sold the lumber through its own offices. From the cutting of the trees until the last board is loaded on the cars this company handles its entire product. The result is low cost of operation and economy in selling —distinct savings which the customers of this company enjoy. When you buy from Chapman-Dewey you buy direct from the tree.

This Company can offer at this time some exceptional quotations on Hardwoods for a great variety of manufacturing purposes. Wire our expense for quotations.

CHAPMAN AND DEWEY LUMBER CO.

Kansas City, Mo. — Memphis, Tennessee — Marked Tree, Ark.

OAK, ASH, RED GUM
SAP GUM, SYCAMORE

MAPLE, ELM
CYPRESS, COTTONWOOD

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" Fas.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

QUARTERED RED OAK
- 5 cars 4/4" Fas.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.

QUARTERED RED GUM
- 5 cars 4/4" Fas.
- 2 cars 4/4" Fas. Fig.
- 2 cars 5/4" Fas.
- 2 cars 6/4" Fas.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM S.N.D.
- 5 cars 5/4" No. 1 Com. & Btr.
- 5 cars 6/4" No. 1 Com. & Btr.
- 10 cars 8/4" No. 1 Com. & Btr.

ASH
- 4 cars 10/4" No. 1 Com. & Btr.
- 1 car 12/4" No. 1 Com. & Btr.
- 1 car 6/4" No. 1 Com. & Btr.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.
- 1 car 5/4" No. 1 Com. & Btr.

SAP GUM
- 10 cars 4/4" Fas.
- 3 cars 5/4" Fas.
- 3 cars 6/4" Fas.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 5 5/4" No. 1 Common.
- 5 cars 6/4 No. 1 Common.

PLAIN RED OAK
- 2 cars 4/4" Fas.
- 3 cars 5/4" Fas.
- 3 cars 6/4" Fas.
- 2 8/4" Fas.
- 10 cars 4/4" No. 1 Common.
- 5 cars 5/4" No. 1 Common.
- 5 cars 6/4" No. 1 Common.

PLAIN WHITE OAK
- 4 cars 4/4" No. Com. & Sel.

COTTONWOOD
- 2 cars 4/4" Fas.
- 10 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

Charles O. Maus Lumber Co.

South Bend, Ind., U.S.A.

Southern & Northern Hardwood Lumber

Red Gum (plain or quartered)
Sap Gum (plain or quartered)
Oak (plain or quarter cut)
Ash
Maple
Basswood
Southern Elm
Cottonwood
Cypress
Tupelo
Oak Timbers
Birch
Beech

If you want dry stocks and honest grades, we have them.

High Grades Service

Why not give us a trial?

DRY STOCK

For Immediate Shipment

SOFT ELM		
6905′	1″	—No. 1 C&B
3195′	1″	—No. 2 Com.
41030′	1½″	—No. 1 C&B
2356′	1½″	—No. 2 Com.
56880′	2″	—No. 1 C&B
10046′	2″	—No. 2 Com.
110594′	2½″	—No. 1 C&B
28985′	2½″	—No. 2 Com.
11750′	3″	—No. 2 Com.
WHITE ASH		
87848′	2″	—No. 1 C&B
3072′	2″	—No. 2 Com.
139960′	2½″	—No. 1 C&B
18587′	2½″	—No. 2 Com.
18992′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.
HICKORY		
650′	1″	—No. 1 C&B
1408′	2″	—No. 1 C&B
COTTONWOOD		
1620′	1″	—No. 1 C&B
19956′	2″	—No. 1 C&B
1196′	2″	—No. 2 Com.
BLACK WALNUT		
2873′	1″	—No. 1 C&B
1151′	1″	—No. 2 Com.
WILLOW		
1446′	1″	—No. 1 C&B
CHERRY		
4747′	1″	—No. 1 C&B
2137′	1″	—No. 2 Com.
ROCK ELM		
12493′	2″	—No. 1 C&B
SOFT MAPLE		
14397′	2½″	—No. 1 C&B
BASSWOOD		
1549′	1″	—No. 1 C&B
606′	2″	—No. 1 C&B
BUTTERNUT		
2584′	1″	—No. 1 C&B
HARD MAPLE		
31788′	1″	—No. 1 C&B
243927′	1¼″	—No. 1 C&B
227707′	1½″	—No. 1 C&B
1796′	1½″	—No. 2 Com.
217401′	2″	—No. 1 C&B
11410′	2″	—No. 2 Com.
38016′	2½″	—No. 1 C&B
11091′	3″	—No. 1 C&B
2796′	4″	—No. 1 C&B
BEECH		
3000′	1½″	—No. 2 Com.
500′	2″	—Log run
250′	2½″	—Log run
350′	3″	—Log Run
100′	4″	—Log run
BIRCH		
15998′	1″	—No. 1 C&B
22811′	1¼″	—No. 1 C&B
11748′	1½″	—No. 1 C&B
50157′	2″	—No. 1 C&B
87172′	2½″	—No. 1 C&B
7866′	3″	—No. 1 C&B
PLAIN OAK		
9869′	1″	—No. 1 C&B
1107′	2″	—No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

In July We Sold

25 cars of Lumber

in Canada Alone

There is a Reason

(with apologies to Postum)

They Satisfy

(with apologies to Chesterfields)

We want to move quickly:

4/4 and 8/4 No. 1 Com. Quartered Red Gum
4/4 No. 1 Common Quartered White Oak
4/4 No. 2A Common Poplar
4/4 No. 1 Common Poplar
6/4 No. 1 Common Walnut
8/4 No. 1 Common Walnut

Satisfactory Service

R. R. May Hardwood Co.

1522 S. Sixth St Louisville, K.Y.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Ply Wood Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Southern Hardwoods

GUM
POPLAR
and OAK

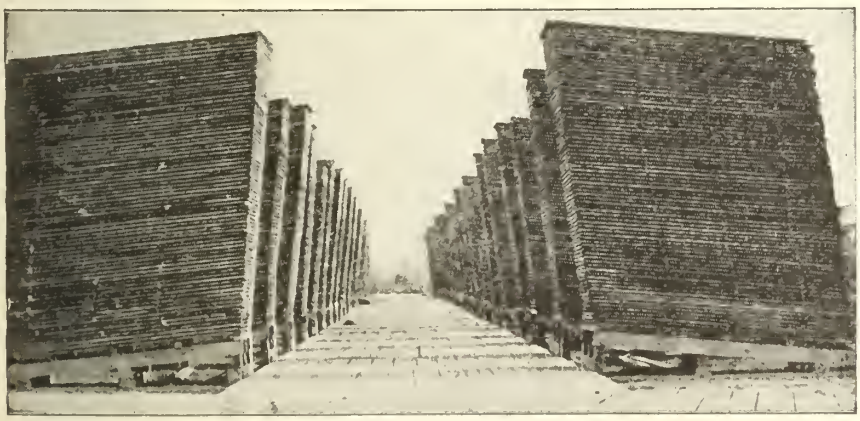
The fact that most manufacturers who try our products for the first time eventually become regular customers, should be an indication of the satisfaction you may expect to receive in a trial order. May we be permitted to demonstrate our qualifications for handling your business.

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY Memphis - Tennessee SERVICE

Efficiency Marks Every Step of Our Service to You



Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

Buy Walnut Now

Every Size in Walnut Lumber Now in Stock to Meet Your Needs

Reviving business and the increasing trend toward Walnut is bringing steadily increasing demand for Walnut lumber.

Mills like all other businesses, have been buying cautiously, stocks throughout the country below the normal. Rapid increase in buying may bring shortages of the items you most desire.

We, therefore, advise your looking over your stocks and anticipating your needs now, while conditions are most favorable.

Just at the present moment we can supply on short notice practically any need in Walnut—every piece of the selected quality and perfect cure that have made Iowa Walnut the first choice of some of the best cabinet makers in America.

Write or wire your needs to us and let us quote you on Iowa Walnut—in both lumber and veneers—the best in American Walnut.

IOWA
Walnut
Grown on
Iowa
Corn Land

Des Moines Sawmill Co., 1024 Murphy St., Des Moines, Iowa

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

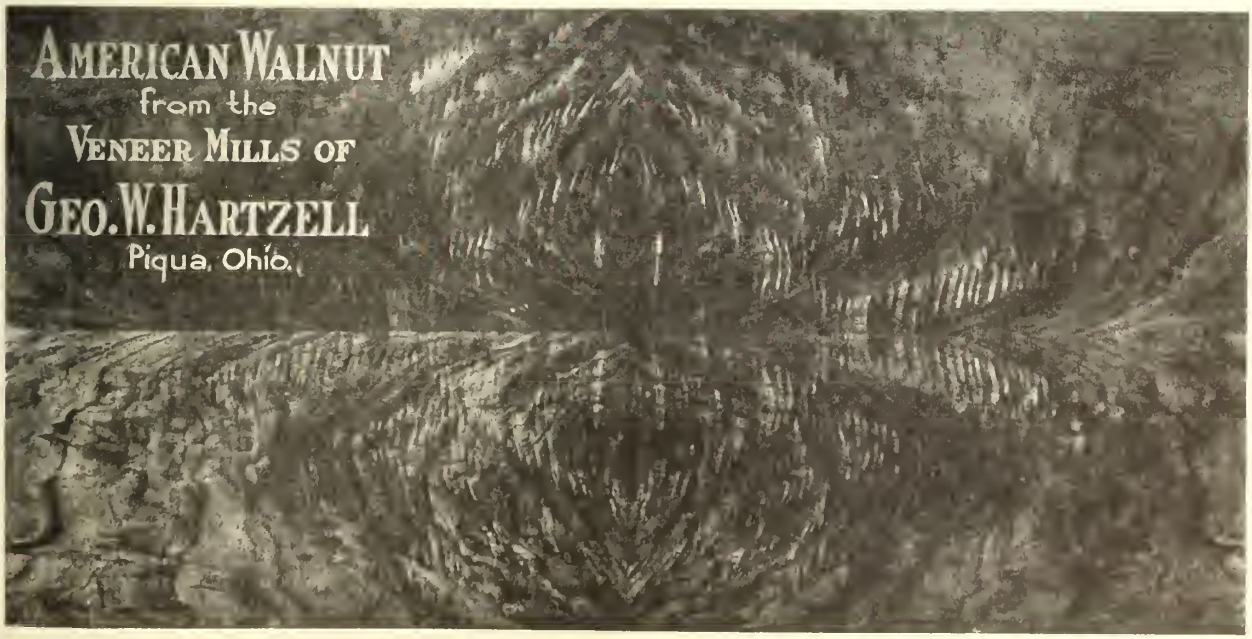
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

Sawed Veneer

Quartered White Oak

For Furniture and Panels

Plain Red Oak

For Interior Trim and Doors

Cypress

For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.

MEMPHIS, TENN.

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment

All grades and thicknesses

Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

ELM MAPLE

FOR SALE **RUSH LUMBER COMPANY** *FOR SALE*

GUM OAK

ASH POPLAR

	QTD. WHITE OAK		4-4	Sound Wormy	25,000′		
4-4	F. A. S.	2,000′	4-4	No. 3 Com.	70,000′		
4-4	F. A. S. 10″ & up	1,000′	5-4	F. A. S.	2,000′		
4-4	No. 1 Com.	15,000′	5-4	No. 2 Com.	13,000′		
4-4	No. 2 Com.	15,000′	6-4	No. 1 Com.	2,000′		
5-4	F. A. S.	14,000′		PLAIN RED OAK			
5-4	No. 1 Com.	8,000′	3-4	No. 1 & 2 Com.	70,000′		
5-4	No. 2 Com.	4,000′	4-4	F. A. S.	2,000′		
6-4	No. 1 Com.	30,000′	4-4	No. 1 Com.	10,000′		
6-4	No. 2 Com.	20,000′	4-4	No. 2 Com.	20,000′		
8-4	F. A. S.	5,000′	5-4	F. A. S.	7,000′		
8-4	No. 1 Com.	3,000′	5-4	No. 1 Com.	15,000′		
	PLAIN WHITE OAK		5-4	No. 2 Com.	3,000′		
4-4	No. 1 Com.	5,000′		QTD. RED GUM			
4-4	No. 2 Com	8,000′	4-4	F. A. S.	7,000′		

4-4	No. 1 Com.	13,000′		POPLAR			
5-4	F. A. S.	2,000′	4-4	No. 2 A Com.	25,000′		
6-4	F. A. S.	3,000′	4-4	No. 2 B Com.	35,000′		
6-4	No. 1 Com.	14,000′	5-4	Sel. & Bet.	9,000′		
	RED GUM S. N. D.		5-4	Saps	3,000′		
8-4	No. 1 C&B.	70,000′	5-4	No. 1 Com.	12,000′		
10-4	No. 1 C&B.	40,000′	5-4	No. 2 A Com.	8,000′		
	SAP GUM		6-4	Sel. & Bet.	7,000′		
5-8	No. 2 Com.	7,000′	6-4	No. 2 Com.	12,000′		
5-4	F. A. S.	1,000′	8-4	Sel.	3,500′		
5-4	F.A.S. 13″ & Up	4,000′	8-4	Sap	8,000′		
5-4	No. 1 Com.	9,000′	8-4	No. 1 Com.	3,000′		
6-4	F. A. S.	11,000′		MISCELLANEOUS			
6-4	No. 1 Com.	6,000′	4-4	L. R. Qtd. B. Gum	25,000′		
6-4	No. 2 Com.	4,000′	4-4	L. R. Pln. B. Gum	25,000′		

MEMPHIS, TENN.

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash and other Hardwoods

Oak Timbers and Planking

THE MOWBRAY & ROBINSON LUMBER CO.

Office: CINCINNATI, OHIO

Canadian Representative:
A. K. Johnson, Traders' Bank Building, Toronto, Ont.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

WAYNE LUMBER CO.

Manufacturers and Wholesalers

American and Canadian
Hardwoods

Birch and Maple—Our Specialty

Special items we want to move:
BIRCH 50,000′ 1″ No. 1 C & B
60,000′ 2½″ No. 1 C & B
40,000′ 3″ No. 1 C & B
MAPLE 2 carloads 2″ No. 1 C & No. 2 C
1 carload 1¼″ No. 2 Com.
SOFT ELM 70,000′ 1″ log run
70,000′ 2″ log run
BASSWOOD 1 carload 2″ log run

110 West 40th St. New York

BEDNA YOUNG
Lumber Company

Jackson - Tennessee

Manufacturer of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for

High Grade Lumber

please let us have your enquiries.

HARDWOOD LUMBER

"A Quality you will admire"

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Kiln Dried Products

Our kiln at Owensboro is a thoroughly modern equipment for handling green or dry lumber with efficiency and entire satisfaction.

Our facilities enable us to give real service—straight or mixed carloads.

Try our soft textured and finely figured quartered-sawn red and white oak. It will please you.

J. V. Stimson & Company

OWENSBORO - KENTUCKY

Bandmills: Owensboro; Campbellsville, Kentucky

DIMENSION

On hand for immediate shipment

Clear White & Red Oak—	
1 car 1-¼ x 2-¼-40″	D
1 car 1-¼ x 2 -40″	M
2 cars 2 x 2-30″	D
1 car 2 x 2 & 2½ x 2½-30″	D
1 car 2 x 2-19″	D
Clear Sap Gum—	
1 car 2 x 2 & 2½ x 2½-60″	M
2 cars 2 x 2 & 2½ x 2½-18″	M
2 cars 2 x 2-19″	D
2 cars 2 x 2-19″ (35% RED)	D

D-Dry M-Partly Dry G-Green

"We can furnish your requirements in OAK and HICKORY WAGON STOCK and BENDING MATERIAL; also clear FURNITURE DIMENSION in squares or flat stock. Write us for prices."

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office Dimension Mill & Yard
Belt Line at McLean.

MEMPHIS - TENN.

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated

General Office, NEW ORLEANS, U.S.A

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn
Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

A few Specials :

130,000 ft. 4/4" No. 1 and No. 2 Common Qtrd. White Oak
65,000 ft. 4/4" No. 1 and No. 2 Common Plain White Oak
100,000 ft. 4/4" No. 1 and No. 2 Common Poplar

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Buffalo for Hardwoods

"LET BUFFALO DO IT"

Buy and Sell Your Hardwoods in Buffalo

Do you want prompt shipment? We can give you service. Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.

Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

Frank T. Sullivan
Specialities:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
Northern Grey Elm
and
Brown Ash
Niagara Street Cornor Arthur

ATLANTIC LUMBER COMPANY
HARDWOODS
West Virginia Soft Red and White Oak
Our Speciality: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller, Sturm & Miller
1142 Seneca Street
Hardwoods of All Kinds

YEAGER LUMBER CO., Inc.
SPECIALITIES
Oak, Poplar, Ash, Maple
932 Elk Street.

STANDARD HARDWOOD LUMBER COMPANY
HARDWOODS
Prompt Shipment { From Buffalo Yards or from mill direct to you
8 Million Feet Dry Stock on hand
1333 Clinton St.

G. Elias & BRO., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and fir timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B WALL Pres. T. H. WALL Vice-Pr.
M. M. WALL, Treasurer
940 SENECA ST.
We Specialize in White Ash, Oak, Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

HUGH McLEAN LUMBER CO.
Hardwoods of all Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

TAYLOR & CRATE
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

Since 1883

THIRTY-NINE years ago Henry Pedwell founded the Pedwell Lumber interests.

In those pioneer days the furniture trade was but a tithe of what it is today. The automobile industry was unthought of. And hardwoods were for the most part put to inconsequential use.

Yet today Canadian Hardwoods find their way not only to Canadian and American factories, but to European markets as well.

The Pedwell Hardwood Lumber Company has enjoyed marked success during these few decades. Its clientele reaches West of the Rockies, South of the Line and across the Atlantic.

The four-square dealing and courteous service, which today is so much a part of our policy, has been largely responsible for this phenomenal growth.

Pedwell service means something to Pedwell clients. It is significant that some of our business friends of 1883 are today being served by us.

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVENUE : : TORONTO

Specialty E C & S *Birch*

This desk was designed for durability; it is made of

CLARK'S CANADIAN BIRCH

The beauty of Canadian Birch is unquestioned in the minds of many large manufacturers who use it in executing their designs for the most exquisite of furniture.

Canadian Birch is also recognized as the ideal wood where durability must be combined with good appearance. One of the large American makers chooses Clark's Birch for school desks —a product demanding the utmost in durability of its materials.

Edward Clark & Sons Limited

807 Bank of Hamilton Building Toronto, Canada

EFFICIENCY *COURTESY* *SERVICE*

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES – that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

AMERICAN BLACK WALNUT

LUMBER **VENEERS**

OUR SPECIALTY

We are prepared to furnish straight or mixed cars, all grades 3/8" to 4" in thickness.

BAND MILL IN DAILY OPERATION

....Various items in Quartered White and Red Oak and Cherry.

1/28". SLICED. WALNUT VENEER especially selected for quality wood and color.

The Kosse, Shoe and Schleyer Co.

Lock Box No. 18 St. Bernard, Cincinnati, Ohio.

Agents in all Furniture Centres.
Offices: Baltimore, Md., Jamestown, N.Y. and Grand Rapids, Mich.
Represented in Chicago, Rockford, Ill., Detroit, Kitchener, Ont., Canada, New York City and San Francisco.

WOOD TURNINGS

Let us quote you on your requirements for handles and small wood turnings

J.H. Connor & Son
Limited
Ottawa Ont.

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co. Limited
ORILLIA ONTARIO
Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1	in.—	52,000
1¼	in.—	2,500

CHERRY

		1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1	in.	42,500	1,800	111,900	62,000
1¼	in.	13,500	200	50,600	25,500
1½	in.	15,200	.....	35,700	64,300
2	in.	21,000	.....	28,200	63,900
2½	in.	5,500	.....	4,200	2,200
3	in.	22,700	.....	6,500	5,300
4	in.	4,900	.....	900	400

CHESTNUT

		1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾	in.	1,500		57,000	60,000
1	in.	89,000	3,500	63,000	87,000
1¼	in.	30,800	300	51,200	140,200
1½	in.	29,500	1,600	57,000	26,200
2	in.	20,200	.....	22,300	50,200
2½	in.	4,000	.....	1,000	700
3	in.	.....	.....	300	500
4	in.	1,500	.....	300	.....

QUARTERED WHITE OAK

		1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
½	in.	6,100	.....	.....	.....
¾	in.	900	300	6,600	10,000
⅝	in.	2,800	.....	6,500	800
1	in.	22,300	15,000	19,400	21,000
1¼	in.	2,000	.....	8,000	500
1½	in.	9,000	.....	7,500	.....
2	in.	6,000	.....	22,100	6,700
2½	in.	2,000	.....	400	.....
3	in.	.....	.....	700	.....
4	in.	2,500	.....	1,700	.....

PLAIN WHITE OAK

		1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
⅝	in.	2,150	.....	3,000	16,900
¾	in.	241,800	.....	379,000	80,000
1	in.	71,300	.....	94,000	18,200
1¼	in.	10,700	400	300	.....
1½	in.	61,300	.....	88,000	700
2	in.	35,000	.....	79,000	12,000
2½	in.	124,800	.....	47,500	2,000
3	in.	9,800	.....	35,800	1,400
3½	in.	4,500	.....	5,000	.....
4	in.	26,000	.....	20,500	.....

PLAIN RED OAK

		1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾	in.	163,000	.....	279,000	39,800
⅝	in.	.....	.....	74,000	42,000
1	in.	119,200	2,150	30,000	9,400
1¼	in.	31,700	4,400	14,600	300
1½	in.	65,000	4,500	30,200	4,000
2	in.	71,500	.....	160,000	70,000
2¼	in.	1,500	.....	1,400	.....
2½	in.	94,100	.....	33,000	.....
3	in.	20,800	.....	20,500	7,000
4	in.	2,600	.....	4,900	.....

QUARTERED RED OAK

		1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
½	in.	1,700	.....	9,700	500
1	in.	4,200	5,400	5,500	1,400
1¼	in.	5,900	.....	1,200	.....
1½	in.	.....	.....	400	.....
2	in.	.....	.....	8,400	.....

SAP GUM

		1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
1	in.	.....	400	.....	.....
1¼	in.	.....	200	2,000	
1½	in.	2,400	6,000	13,500	
2	in.	5,100	.....	8,400	
3	in.	.....	.....	.....	

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	2,500	12,000
5/4	.....	14,000	.....
8/4	.....	15,500	6,000
10/4	.....	10,250	15,000 1,800
12/4	.....	3,500	4,000 300

PLAIN RED GUM

		1 & 2	No. 1 Com.	No. 2 Com.
1	in.	31,300	14,900	10,000
1¼	in.	19,000	18,325	600
1½	in.	32,000	94,300	23,500
2	in.	3,000	12,000	11,500

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	51,000	7,000
5/4	.....	20,400	31,800 200
6/4	.....	29,900	50,000 5,600
8/4	.....	44,300	50,500 15,000
10/8	.....	2,000	3,000 .....

POPLAR

		1 & 2	Bright Saps	No. 1 Com.	No. 2 Com.
¾	in.	1,100	1,500	9,000	.....
⅝	in.	6,000	2,200	56,300	1,800
1	in.	53,000	11,200	91,000	5,800
1¼	in.	61,300	12,600	43,700	5,000
1½	in.	18,100	.....	11,000	22,500
2	in.	1,000	1,300	4,400	7,500
2½	in.	7,800	150	9,800	350
3	in.	4,900	5,000	2,900	31,000
4	in.	200	5,200	300	450

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto
MANUFACTURERS SOUTHERN HARDWOOD LUMBER
Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft.....8/4 No. 1 Com

Band-mills at Baton Rouge, La. Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

Mills: Coal Grove, Ohio

CANADIAN ENQUIRIES SOLICITED

General Offices: 33 Rector St. New York City

Ash Poplar Cypress

HAFNER

MANUFACTURING COMPANY

1 Car 4/4 FAS. Pl. Red Gum.
1 " 5/4 " " " "
1 " 6/4 " " " "
½ " 8/4 " " " "
3 " 4/4 No. 1 C&S. " "
1 " 6/4 " " " "
2 " 8/4 " " " "
2 " 4/4 No. 2 Com. " "
1 " 4/4 No. 1 C&B. Figured Red Gum.

1 Car 4/4 FAS Qtd. Red Gum.
2 " 5/4 " " " "
1 " 6/4 " " " "
1 " 4/4 No. 1 C&S. " "
2 " 5/4 " " " "
½ " 6/4 " " " "
2 " 1 x 13-17 Sap Gum Box Bds.
1 " 4/4 FAS Sap Gum.
1 " 8/4 No. 1 C&S. Sap Gum.

1 Car 4/4 FAS Pl. Red Oak.
½ " 5/4 " " " "
1 " 6/4 " " " "
1 " 8/4 " " " "
4 " 4/4 No. 1 C&S. " "
3 " 5/4 " " " "
1 " 8/4 " " " "
2 " 4/4 No. 1 C&B. Sound Wormy.
1 " 5/4 No. 1 C&B. Sound Wormy.

Thoroughly dry ready for immediate shipment in mixed cars if you desire

ST. LOUIS, MO., U.S.A.

E S T A B L I S H E D 1 8 7 1

Oak Red Gum

Lumber Specials

We can ship promptly the following items of Southern Hardwoods on hand at our Little Rock Mill. This stock is of our own manufacture, band sawn, dry, good widths and excellent lengths graded strictly according to National Hardwood Lumber Association Rules. This stock is offered subject to prior sale.

QUARTERED RED GUM

3	Cars	5/4"	FAS
1	"	6/4"	"
3	"	8/4"	"
1	"	12/4"	"
2	"	4/4"	No. 1 Com. & Sel.
3	"	5/4"	" " " "
6	"	6/4"	" " " "
2	"	8/4"	" " " "
½	"	10/4"	" " " "
1	"	12/4"	" " " "

QUARTERED SAP GUM

4	Cars	5/4"	FAS
17	"	8/4"	"
1	"	4/4"	No. 1 Com. & Sel.

PLAIN SAP GUM

1	Car	4/4"	FAS

QUARTERED FIGURED RED GUM

10	M	4/4"	FAS
10	M	5/4"	"
2	Cars	4/4"	No. 1 Com. & Sel.

PLAIN FIGURED RED GUM

3	M	5/4"	FAS

PLAIN RED GUM

½	Car	6/4"	No. 1 Com. & Sel.

QUARTERED WHITE OAK

1	Car	5/4"	FAS
¼	"	8/4"	No. 1 Com. & Sel.

WEIGHTS PER THOUSAND FEET

	Air Dried	Kiln Dried
Oak	4400 lbs.	4000 lbs.
Red Gum	3500 lbs.	3200 lbs.
Sap Gum	3300 lbs.	3000 lbs

E. L. BRUCE COMPANY

MANUFACTURERS

MEMPHIS, TENN.

Band Mill: LITTLE ROCK

Oak Flooring Plants: MEMPHIS; LITTLE ROCK

Walnut
Oak
Poplar
Chestnut
Gum
Ash

Will Ship High Class Stock and Make Prompt Shipment.

Leland G. Banning

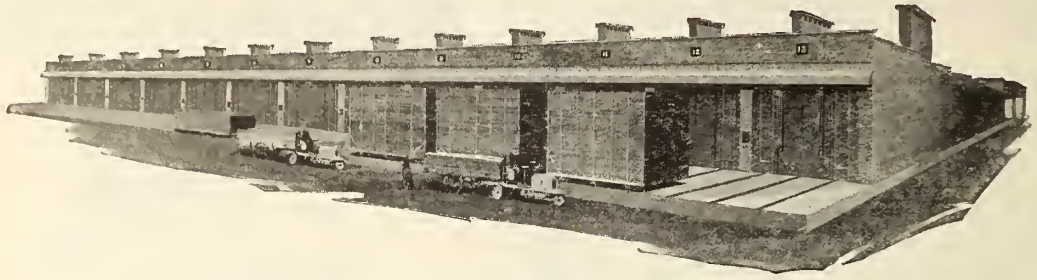
Cincinnati, Ohio

Canadian Representative:

A. E. Klippert, 11 Laxton Ave

Toronto

KILN DRIED HARDWOODS



Kiln capacity 3,000,000 ft. monthly

WEST VIRGINIA
OAK
CHESTNUT
WHITEWOOD
BIRCH
HICKORY

We earnestly solicit your inquiries

AROMATIC RED CEDAR

ARKANSAS
RED GUM
SAP GUM
OAK
ASH
ELM

The M. B. Farrin Lumber Co.

CINCINNATI, OHIO

Dependable Shippers of American Hardwoods

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars

All Canadian and American Hardwoods
Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO

Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.

Subscription, Canada, Great Britain and British Possessions $2.00; United States $2.50; other Foreign Countries $2.00.
Single Copies 15 Cents.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 **Toronto, August 1922** **No.8**

Is Your Kiln Drying Satisfactory?

In making the rounds of various plants and factories the "Canadian Woodworker" often hears stories of how so and so lost a whole kiln load of lumber, valued at more than a thousand dollars or that another firm is experiencing trouble due to open joints and warping, while a third finds that in spite of his best efforts the lumber will check while being treated and so on down the whole list of kiln drying troubles and after effects. It would seem that the manufacturer who is not bothered with kiln drying troubles and those due to imperfect seasoning, is the exception rather than the rule.

It was not so very long ago that all this was taken as a matter of course. Woodworkers seemed to be resigned to the belief that while such troubles were annoying and costly in the extreme, they were unavoidable and must therefore be accepted with the best grace possible. However, that attitude has undergone a rather complete change, due largely to the advance which has been made in the theory and practice of kiln drying and to-day woodworkers see the folly of their old acquiescent attitude, and as a result they are attempting to grapple with their drying problems in a more or less whole-hearted manner.

In this they are handicapped because of a lack of knowledge of the fundamentals which underlie kiln drying as advocated and practiced to-day. True, many woodworkers have remodelled their kiln drying equipment or even put in a new battery of kilns, but the operation of the kiln is more or less perfunctory or rule of thumb. That is, it is customary to follow rigidly a set of rules which is supposed to cover drying of all ordinary woods but which does not make allowance for the unusual or out-of-the-ordinary condition or occurrences or which does not take into consideration the individual peculiarities of each installation of kilns and of each charge of lumber dried. Until all kilns are identical in every way, not only as to physical characteristics but in their operation, and until all lumber is graded so uniformly that each charge will be exactly the same as the preceding and the succeeding ones—something which is absolutely absurd to even consider—until such a time the operation of a kiln by rules will always be a source of annoyance and expense.

The suggestion that the operator is more important than the equipment, that poor equipment in the hands of a good operator is better than good equipment in charge of a poor operator is true and is worth repeating, for until it is accepted in its entirety and acted upon, trouble is bound to be experienced. If the present operator is not susceptible to new ideas, if he thinks he knows it all and is not willing to study and learn, an effort should be made to secure a man who knows how and why, who knows how lumber dries, how the drying may be controlled, the cause of various troubles and how they may be prevented and who in other ways is able to operate the kiln intelligently. It is the operator who counts. A good operator is worth a good salary for he can save a lot of trouble and expense.

Recently, furniture manufacturers have evinced a decided interest in this important phase of woodworking. Working in close co-operation with the University of Toronto, the Furniture Manufacturers' Association has been instrumental in securing the services of a trained research man who has been visiting various plants, studying conditions and methods as found in connection with the drying of lumber and assisting in every way he can. This work has been productive of real tangible results.

Realizing the need for assistance in this direction, we understand that certain manufacturers of hardwood lumber have subscribed to a special technical lumber service which they are offering free to their customers. This is a little broader than a strictly kiln drying service as it includes air drying, the handling of lumber, kiln drying and the suitability of various grades of lumber. This service includes the assistance of trained men who will visit plants free of charge and assist in improving the kiln drying and lumber handling methods and in overcoming any troubles which may be experienced in the seasoning and drying or in subsequent manufacturing operations where the question of suitability of grade or condition of the stock enters.

We all complain of the shortness of time, and yet have much more than we know what to do with.

High Core Production at Lowest Cost

How the Wood-Mosaic Co. Have Developed a Highly Efficient Gluing Department, Reduced Costs and Increased Production — Clamp Carriers an Important Feature of the Plant Equipment

By R. W. Burns*

Considerable interest has been evidenced in the article "Development of Edge Gluing" which appeared in the February number of the "Canadian Woodworker." This interest seems to center around the high production obtained by the Wood Mosaic Co., of Louisville, Kentucky, on their ten Taylor clamp carriers. It is therefore to fulfill the desire of the trade for a further explanation of their methods that this article is published.

The report of one week's core production on two Taylor clamp carriers at Wood-Mosaic Co. was published in the article mentioned above, which when analyzed, showed 20½ to 24 revolutions per 40 section machine per nine-hour day, with an accompanying production of from a minimum of 1,705 to a maximum of 3,150 finished cores per machine and a minimum of 6,528 to a maximum of 7,827 surface feet of finished stock per machine per nine-hour day

Routing Well Arranged

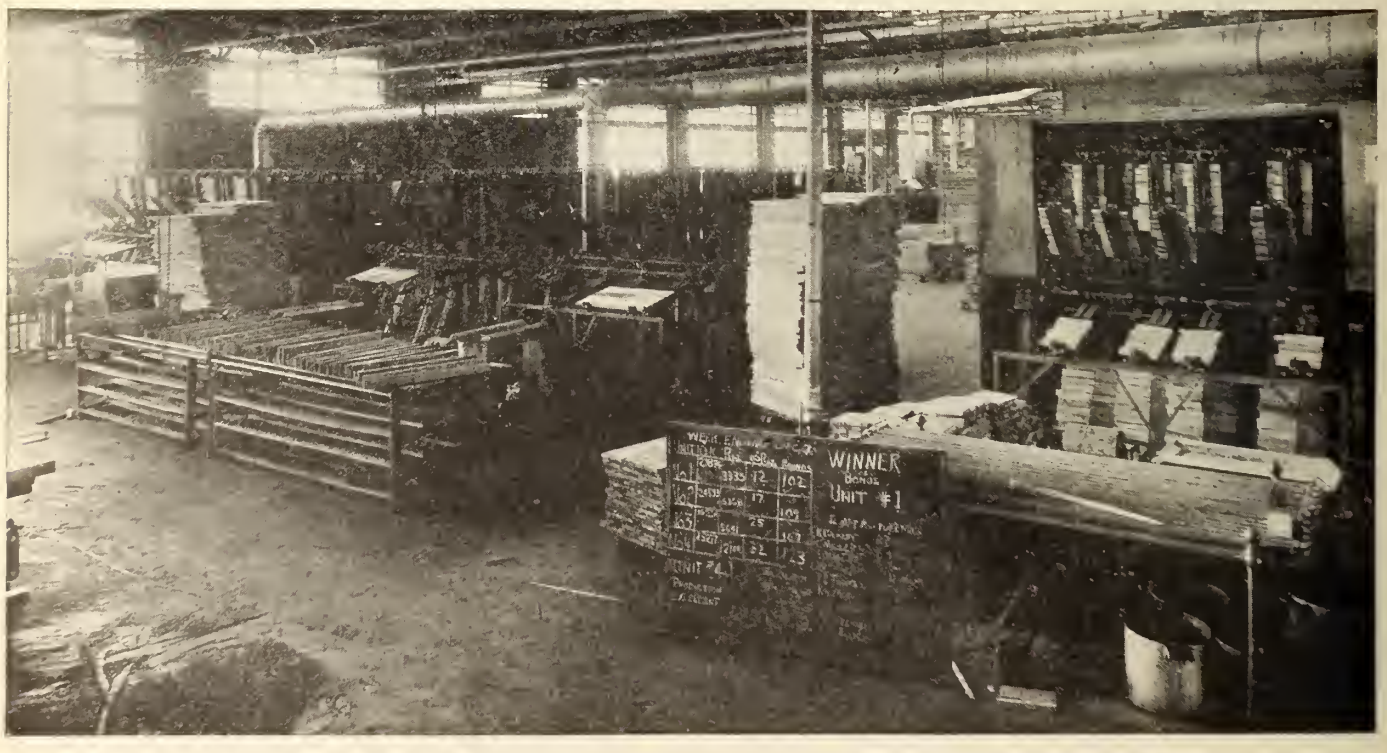
Wood-Mosaic Co. have arranged their machinery so that material travels practically straight through the factory, thus not only making the moving of material efficient but making it possible to locate congestion easily and remedy it quickly. At the extreme end of the factory are the dry kilns with the most modern methods for bringing the lumber to the rip and cut-off saws. From here the stock goes to the matching saws and then passes on to the glue jointers, which are placed one beside the other clear across the factory.

Directly ahead of these jointers is the battery of ten 40-section Taylor clamp carriers. On an average one continuous glue jointer keeps work ahead of one Taylor clamp carrier. The high grade core and top work is all put through the glue jointer per customer's specifications. However, in the past they have glued large quantities of core stock direct from the rip saws.

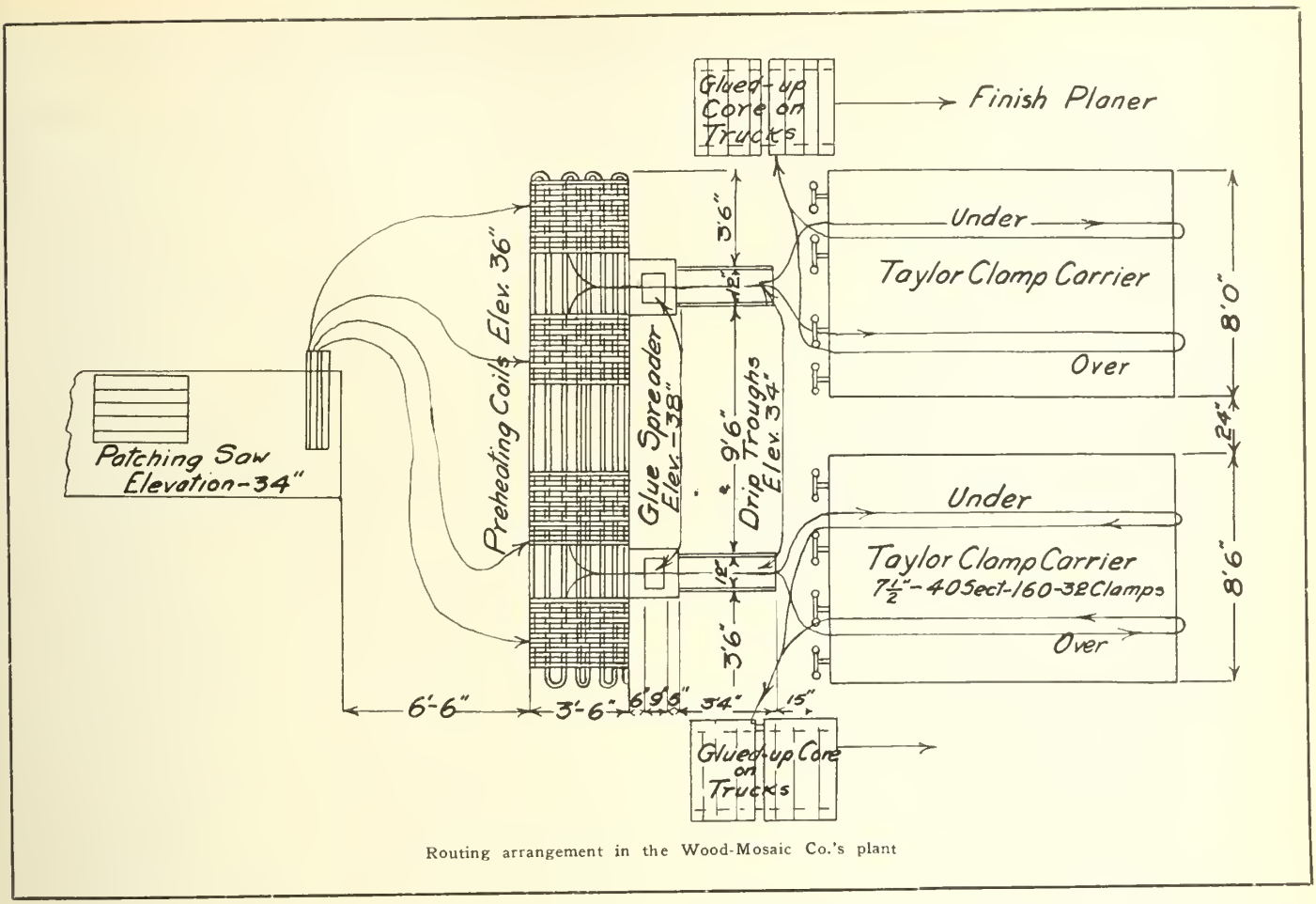
Between the continuous feed glue jointers and the Taylor clamp carriers are preheating coils through which steam passes. These coils are shown in the accompanying layout and are at such an elevation and location as to be conveniently accessible both to the glue jointers and the clamp carriers. The pieces composing each individual core are set on edge as a unit on the preheating coils by the jointer operators. Under these coils are racks for surplus stock.

The layout shows the position of the preheating coils and glue rolls in relation to the clamp carriers. There are two operators to each Taylor clamp carrier. Each operator gets the stock for his core from the heating coils, draws it with one motion of the arms across the glue roll and with a very adroit movement makes the pieces composing his core slide one over the other onto the clamps so that the latter can be immediately tightened. The stock is then pounded down with a mallet, and each operator contributes to turning the carrier to the next section. This turning of the machine is done very easily and much more quickly than a power driven machine because of the

*Of Jas. L. Taylor Mfg. Co., Poughkeepsie, N.Y.



This picture with the one opposite forms a panoramic of the interior of the Wood-Mosaic Co.'s plant



Routing arrangement in the Wood-Mosaic Co.'s plant

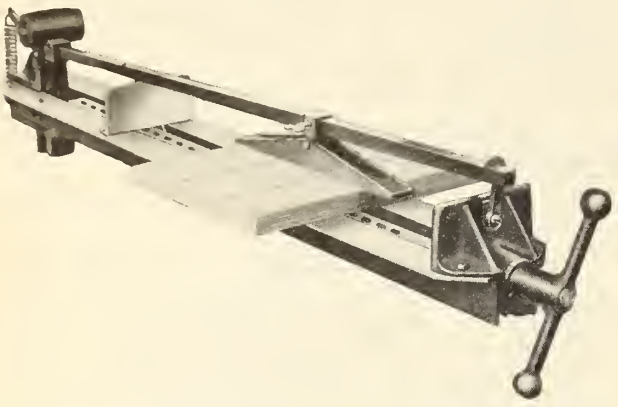
acceleration possible by hand pull and discontinuing the pull at the proper time according to the load. The glued-up stock is then removed from this succeeding section now in front of the operators, each operator removing his own core, but the other operator nearest the aisle piles the two cores on the truck. After being filled these trucks are pushed out of the way and the following day the cores go through the planer. Often when the cores are narrow each operator can insert two cores edge to edge in one set of clamps, in which case the removable pressure bars (shown in cut of clamp) can be quickly inserted and drawn down

Note how the arrangement of the equipment makes for ease and rapidity of handling

to keep the work from buckling when the clamps are tightened. In the case of these narrow cores the production is four cores per section.

Fan Aids Glue Setting

The Wood-Mosaic Co. control the humidity of their plant and keep it uniformly dry, but during the damp days in the warm months when the glue does



The carrier clamp that facilitates gluing operations by the Wood-Mosaic Co.

not have a tendency to set so quickly, they operate a big fan which is located in the center of the factory. This fan is piped above and across the battery of clamp carriers. Between each two machines a pipe leads down to two flaring nozzles. When the fan is operated the air is blown from one of these nozzles directly on the freshly glued cores of one clamp carrier and from the other on the cores in the adjacent machine to help set the glue. In this way, together with high grade animal glue, they can get their work to set satisfactorily in twenty minutes, if necessary.

Wood-Mosaic Co. realize that in order to get good production they must pay their men well, and therefore pay a high enough wage to get good operators. Of course, only good men are allowed to stay on the job. The week is a 50-hour week and the men are paid a bonus for all revolutions of the Taylor clamp carrier over fifty-five (55) per week. This is calculated on a weekly basis to avoid speed and rushing one day and loafing and resting the next.

Rigid Inspection

Before any cores are packed or loaded they are carefully inspected by inspectors employed for that duty only. This inspection on the cores would be considered very good inspection on solid work. Each individual core is inspected on both sides, the joints are tried and on the least indication of an open joint the inspector breaks the core and it is returned for regluing. So rigid is the inspection that sometimes the wood breaks before the joint, when inspected. The good cores are stamped with the inspectors' O. K.

The production obtained by Wood-Mosaic Co. shows to what a high state of efficiency a manufacturer may attain when he concentrates on one product, groups his machines for that product, studies each move to eliminate lost time and material and then puts through such volumes of one size as to make adjustments in his machines infrequent and their operation continuous. The Wood-Mosaic Co. is probably the most modern and efficient plant of its kind in the country.

Fifty Years of Service to the Woodworking Industry — Herman Behr & Co's. Golden Anniversary

An event of considerable interest to the woodworking industry was the celebration on August 7 of the 50th anniversary of the establishment of the firm of Herman Behr & Co., Inc., the well-known manufacturers of sandpapers, whose products have enjoyed a favorable reputation and extensive use by all branches of the wood-using industry. During the half century of its existance the firm has been responsible for several distinct innivations in the manufacture of sandpapers, and it is interesting to sketch the development of the organization, paralleling as it does the growth of the abrasive industry as a whole.

The founder, Mr. Herman Behr, still the active head of the company, was born in Hamburg, Germany, in 1847, and come to the United States at the age of three. After being in business with his father, an importer and manufacturer in a small way, of hardware, he became interested on August 7, 1872, in the manufacture of sandpaper, entering the business with very little knowledge of the process of its manufacture, but relying greatly upon his own ingenuity and experiments, and in fact, making many of his own tools and machines. So well did the business grow, that new quarters had to be secured a year later. From time to time new members were admitted to the firm and in 1911 the company, which had grown by that time to one of the leading houses in the industry, became a corporation under the laws of the state of New York. To-day the plant covers a floor space of 4½ acres at 31-36 Tiffany Place, Brooklyn, with nearly 300 employees in the organization. The company has several branches viz., Chicago, Boston, St. Louis, San Francisco, Grand Rapids, Toronto and London.

Herman Behr & Company has been progressive in all of its undertakings, particularly in developing its own machinery and manufacturing processes to the point where the production of sand papers has become a science. During the fifty years of its existence, the firm has put several distinct innovations on the market. It made the first perfect pouncing paper in the United States. It introduced the first garnet or red sand abrasive paper in the world. Later it made the first flexible cloth belts of abrasive and followed this with the first successful aluminous oxide coated cloth discs for metal grinding . The most recent advancement in the improvement of sand paper is marked by the invention in 1918 of Behr's Openkote Process of putting sand on paper.

The company has been equally progressive in conserving the health, safety, comfort and interest of its employees. its humane welfare work is evidenced by the most improved sanitary conditions in plant and office, voluntary protection for its employees against sickness and want through health insurance, compensation insurance and life insurance. Herman Behr & Co., were among the first to recognize that their obligations to employees did not end with the weekly pay envelope, by the institution of a bonus or profit sharing arrangement, whereby every member of the organization shares to some extent in the profits of the company. The company also enjoys the pleasure of having had men in its employ for forty years and has been dealing with some customers for nearly fifty years and purchasing goods from some concerns for nearly that length of time.

Standardizing Woodworking Operations

Production Knowledge, Which Means Knowing What Your Output Should be, Instead of What It Is, Is the Logical Basis on Which Costs Can Be Lowered and Production Increased—The Application of Time Standards

By L. R. Wright*

"Knowledge" is absolutely essential to the continued success of any industrial or commercial enterprise. By knowledge is meant accurate information pertaining to every phase of the activity of the various divisions of the organization. For instance, accurate cost knowledge is the only true foundation on which the selling price should be based. Similarly, production knowledge is the only logical basis upon which production can be increased and costs decreased. By production knowledge is meant a knowledge of the maximum, not actual, capacity of men and machines covering various classes of work. It is only when this maximum output is known that an intelligent effort can be made to attain the highest degree of productiveness.

It is simple enough for a manufacturer to check over his cost figures, that is, if he is fortunate enough to have them available, and ascertain the output of any machine or workman covering certain classes of work. When he has done this he is not much better informed than before securing this information, for such data does not give any indication of what the output should be. He may rest content thinking he is getting all possible from his equipment or his employees and thus neglect to bend every effort to improve conditions and bring production up somewhere near to what it should be.

Development of Standards of Production

It is only during recent years that a determined effort has been made to develop standards of productiveness for men and equipment in the woodworking industry and in doing this a large number of intricate problems were encountered and solved. To begin with, while all woodworking operations, that is machine operations, may be divided into cutting and handling time, yet on certain classes of work it is the handling time which limits the production of the equipment, whereas on a different class of work the feed or capacity of the machine controls the output. On the sticker, for instance, except when extremely short pieces are being fed through, the rate of feed is the controlling factor and while the rates vary for different classes of work the output should always be directly proportionate to the feed carried. However, when we consider the planer or drum sander we are confronted with another set of conditions. On stock exceeding half the width of the bed, so that only one piece can be fed through at a time, the feed is again the controlling factor, except, as noted above, in the case of extremely short stock, when handling becomes the deciding factor. On another group of sizes a combination of handling time, which depends on length, width and thickness for an employee can pick up a greater number of short pieces than he can of longer lengths or a greater number of thin pieces than if he were working with thicker material, and feed rates must be considered in determining the standard output. With the smallest sizes it is entirely a question of handling, for it stands to reason that an operator could not keep the bed of the machine full when putting through small pieces.

Carrying out this line of reasoning it becomes apparent that it should not take any longer to lift a certain sized piece from a truck and place it on the planer bed than it does to place the same sized piece on the bandsaw or shaper table and further that it should not take any longer in one plant than in another. If it does, there is something wrong somewhere, either with the workmen, the layout of equipment, the way the material is brought up and handled or in some other way. Similarly, similar machines in different plants running at the same cutter head speeds and carrying the same feed should have the same degree of productiveness on the same classes of work. If not, there may be some physical reason.

Systems Applicable to All Operations

Working along in this direction in many plants and over a period of time it has been possible to establish definite standards of productiveness for men, machines, departments and even whole plants. Of course, it was not all as simple as outlined above, for many machines and many operations presented real problems, but in every case it was found possible to reduce the work to certain basic standards which would apply to all plants covering different classes of work. Not only have these standards been developed and applied in connection with machine operations but they have been applied to veneering, assembling, finishing and packing operations so that to-day the whole work of producing furniture from the time the lumber is received to the shipping of the finished product can be carried out on the basis of definitely known time standards.

Now as to the practical application of these standard times, knowing the goal is half the battle. As was suggested in the opening paragraph, production knowledge, which means knowing what the output should be instead of what it is, is the only logical basis upon which costs can be lowered and production increased. These basic time standards provide a basis of comparison by which the relative degree of productiveness of a machine, workman or department may be judged. If found to be low, the problem then resolves itself into ascertaining the reason and applying the remedy and thus bring the output of that particular operation to as near the standard as conditions permit. To make a broader application, a common basis or a common language is established by which the productiveness of workmen and equipment in different plants, and even the plants themselves, may be compared.

How the Pay is Determined

When it is known that after making due allowances for machine care, personal and trucking time, incentive, etc., a certain class of work should be put through at the rate of 100 pieces in so many minutes, say twenty for illustration purposes, what is more

*Statistician, Forest Products Engineering Co., Chicago.

logical than to pay the operator for twenty minutes per every hundred pieces put through. This is fair to both employee and employer alike. As an incentive allowance has been included, if the operator should turn the stock out at the rate of eighteen minutes per hundred pieces, he has still earned twenty minutes and would be paid for twenty minutes. In this way an incentive for close application and a basis for payment by performance covering all operations in a plant may be established that will result in increased productiveness for both men and machines as well as lower overhead costs per unit of production. After all this is nothing more than a practical application of common sense to woodworking practice.

What the Summer Furniture Markets Show

Not Many New Pieces Displayed at American Centres—Prices Have Been Steady with a Forecast of an Upward Movement in Fall —Buying This Year Exceptionally Heavy

In the matters of attendance, interest, display and orders booked, the midsummer furnishings markets at Grand Rapids, Mich., Chicago, Ill., and HighPoint, N. C., have been the best in several years. Manufacturers displaying their products at these exhibitions declase almost without excepton that they have received more real orders than two years ago when there seemed to be quite a demand for furniture. Over 2,500 buyers were registered at Grand Rapids and 4,000 at Chicago, while reports indicate that High Point had the largest attendance in the history of the Southern market. Buying held good from the first day, and many factories would accept orders for only sixty days' production, some of them selling out before the exhibitions closed.

Prices were very firm and showed practically no decline from those holding at the time of the winter markets. It was freely forecasted that prices would show an upward trend by fall, due to the steady increases in material prices. Perhaps it was this fact that led the buyers to buy heavily right from the start. It is said that some of the larger buyers were advising ordering in as large quantities as possible as they predicted good business prospects this fall with prices quite materially increased. At any rate the buying was the heaviest in two years and all the orders were considered bona fide.

As prices have held steady during the past six months there has been no reason for bringing out many new pieces and consequently the buyers at the midsummer markets were not confronted with many outstanding changes in design, at least, three-quarters of the goods exhibited being carried over from January.

No striking new finishes were displayed although it had been anticipated that new developments in this regard would be forthcoming. Very little polychrome or decorated furniture was exhibited, and in many cases manufacturers did not display any polished finishes but showed their lines in flat finish effects

Walnut was the favorite wood and easily outsold mahogany three to one. Gum oak, satinwood, birch and bird's eye maple seemed to be used in about the order indicated. The latter, especially for bedroom furniture, seems to be getting more popular, possibly because of a new rich brown finish that is being applied to it in place of the bleached finish for many years so prevalent. Some makers are also using curly birch with a finish somewhat approximately the appearance of light walnut. Oak in the grey finish has met with some demand. At High Point an exhibit of a Tennessee red cedar bedroom suite attracted considerable attention, and many buyers, in placing trial orders, ventured the belief that this wood will become more popular in the future. Its application in the past has been largely limited to chests and drawer linings. A tendency towards the use of solid woods was observed, many firms which has been using gum legs and posts changing to solid woods.

As far as styles are concerned, there has been no outstanding change in the last six months. English and French influences seem to predominate.

Reading lamps and floor lamps of all descriptions were shown at the markets and were even more handsome than designs previously exhibited. Distinctive shades in a wide range of the colors added to the effectiveness of the display.

Evansville, Ind., will be the location of the next furniture market, September 11-16, being the dates. It is anticipated that the Evansville manufacturers will bring out new designs at attractive prices. The New York display will follow on October 16-18 with the Jamestown exhibition in November.

U. S. Furniture Manufacturers Want Change in Grading Rules

The National Council of Furniture Associations has requested that the National Hardwood Lumber Association abandon its efforts to formulate and establish a hardwood sales code, and devote its energies exclusively to co-operating with the ultimate purchasers of lumber to see that the national hardwood grading rules are developed to as near perfection as it is possible. In addition the Council has suggested changes in the grading rules.

In a bulletin to its members, which repeats the original statement held on July 21 in Chicago, asking that the code efforts be abandoned, the Council announces that arrangements are being made for a conference between the Council's Committee on Lumber and the Grading Rules Committee of the National Hardwood Association, to consider the proposed changes. The changes which the Council proposes are as follows:

Eliminate—Grade "Selects."

Eliminate—Grade Quartered Red Gum—Sap no defect" and substitute for same—grade Quartered Sap Gum.

Eliminate—The "4 per cent" clause.

Insert—Season checks should be considered serious defects.

Change—No. 1 Common to read "'4' and over wide."

Change—Rules to read "All lumber should be graded from the poor side of the board."

How to Level and Tension Large Band Saws

Directions for Testing and Correcting the Tension and Straightness and so Prolonging the Life and Usefulness of Band Saws—Case Hardening to be Carefully Guarded Against

The life of a band saw depends very largely on the way it is handled, particularly when it is new and before it has been perfectly adapted to the wheels on which it is run. Many operators expect a new saw to do more work than one which has been perfectly adapted and adjusted to the wheels and the alignment of the mill. This is a mistake for their are peculiarities about every mill, and until a new saw is adjusted to

Fig. 1—Showing lump or "fast" spot

the face of the wheels, their aligning or tilt, the speed and feed, they cannot be expected to give as good results as the saw which has been properly adjusted in relation to these factors.

There is a certain quality about a new band saw which we can best describe by calling it "surplus" elasticity, and until this quality is brought down to its proper bearing by the judicious use of the hammer and saw stretcher in connection with the first "runs" of the saw, it will not be at its best. All experienced filers and millmen know that excessive speed, too much tension, uneven tension, case-hardening or glazing from the emery wheel, gum adhering to face of wheels, crystallization from too heavy hammering, cuts on the surface of the saw from sharp-faced hammers, vibration of either machine or saw, sharp angles in the gullets, imperfectly-adjusted guides, backs of saws too long or too short and excessively cross-aligned to make them "track," insufficient throat room and hook, and crowding the saw against the guard wheel, will cause it to crack. These are all well-known causes of breakage, yet notwithstanding the knowledge that all band saws are more or less subject to these conditions, too often the cause of fracture is attributed to the quality of the steel or over-hardness.

Many operators of band saws ask advice as to the best manner to fit, tension and operate the saws to attain the best results and to get the most wear out of them. It is with the idea of furnishing some practical information along this line that this article is published, based on practical data submitted by Henry Disston & Sons, Inc., the well-known saw makers. The instructions which follow cover the levelling and tensioning of band saws, properties that are extremely important if their life is to be prolonged and the best quality workmanship obtained from them.

Large band saws, when running idle, should travel in a true plane, with the cutting-edge projecting over the edge of the wheels about the full length or depth of the teeth. This can be accomplished only by true alignment of shafts, proper tilt of wheels, and as regards the saws, accurately made brazes, correct tension, right amount of hook to the teeth for the kind of lumber to be cut, properly swaged and fitted. Assuming the foregoing adjustments have been made, the saws will travel in a true plane and hold their position on the wheels without any lateral motion either in or out of the cut.

Tension means strain and is obtained by stretching

Fig. 2—"Drop" in blade fits tension gauge

the blade between the edges with the tensioning rolls or hammer. If a hammer is used, one with a round face is preferred. The saw must be made flat or level before tensioning. Examine carefully with a straight-edge for lumps across and lengthwise, trace lumps to their full extent and remove by striking with a long or a cross-face hammer as the direction of the lump may require. Be careful not to cut the lump into several small ones by spreading the blows. Hammer lightly and closely—the nearer the blows come together the better. Examine frequently with the straight-edge. Reverse the saw occasionally for inspection, as a beginner is apt to hammer more than is necessary, thus dishing the blade. A little practice

and close attention will soon enable the learner to flatten or level the saws correctly. ,

Proper Amount of Tension

The next operation after levelling the saw is to examine for tension by using a tension gauge. The proper amount of tension varies according to the feed of the mill and crown of the wheel, but under no circumstances do we think it judicious from any point of view to put in so much tension that the saw will not lie flat from its own weight on the levelling table.

Raise the saw, as shown in Fig. 1, holding the tension gauge at right angles to the blade. Mark all fast spots with a crayon, tracing from the beginning and end of each spot. The fast spots are indicated where the centre of the blade shows as a lump under the tension gauge as in Fig. 1.

Roll or hammer between marks until the saw shows under the tension gauge as seen in Fig. 2. Test after each line through the rolls. Roll from the centre of the blade to within about three-quarter of an inch of the edge. If the hammer is used for

Fig. 3—Too much "drop" under tension gauge

tensioning, the blows must be applied on both sides of the blade to prevent dishing. Do not tension on a cast iron block, which is to be used only when lumps are being removed. A hard-faced anvil should always be part of the equipment.

Examine with a straight-edge each time a roll or hammer is used for tensioning and remove any lumps which may have developed. If too much drop shows under the tension gauge, as shown in Fig. 3, roll or hammer on both edges until the drop properly fits the gauge on both sides of the saw.

Examine the back-edge of the saw with a back gauge (See Fig. 4). Mark the extent of the hollow on the back of the saw, if there be one, and roll or hammer from mark to mark. Begin at the centre of the saw and work to the back edge by rolling parallel with the saw. Repeat, if necessary, until the back is stretched to fit the gauge. If the back should be full or lumpy, follow the same course, working from the centre of the blade towards the tooth-edge.

Examine the saw with a straight-edge for lumps and with a tension gauge for irregular tension. Make corrections as the work progresses. When ready for the wheels, the saw should lie flat on the levelling block and fit the tension gauge on both sides when curved and tested as in Fig. 2.

Fig. 5 shows the test for tension on the up bend or outside curve with a short straight-edge. If the saw is correctly tensioned an almost perfect curve will show under the straight-edge between both edges of the saw. If it shows flat, trace its extent and stretch

Fig. 4—Testing the back of the saw

it with a roll or hammer until it shows an even curve.

Accurate Fitting

After the saw has been properly tensioned it should be accurately fitted. The swaging and fitting of the teeth are practically the same as in a full swaged circular saw. The swaging is side dressed or shaped to a uniform width with an under and back cut in order to leave the extreme point of tooth a trifle wider than the rest of the tooth. The full amount of swage when side dressed should never exceed No. 8 gauge in a 14 gauge saw and for hard timber may be even less. It is advisable to run with as little swage as practicable. The tensile strain on

Fig. 5—Testing tension on the up bend

the saw, the power required, and the waste of lumber in the kerf depend to a certain extent on the degree of swaging.

It is also necessary to re-sharpen band saws frequently. Many saws are ruined because they are run after they have become dull. No band saw should be run longer than two and a half hours on one sharpening.

Well tensioned and well fitted band saws, when

properly handled, will stand the maximum feed and manufacture good lumber. But, after the corners of the saws become worn or dull the saws will dodge or leave the line, which has the effect of destroying the tension and fracturing the saws.

Sharpening Band Saws

In sharpening use a medium soft emery wheel and do not crowd it on its work as this would result in case-hardening the gullets. Cracks are liable to start from any one of these case-hardened spots.

Do not give the teeth sharp gullets. This concentrates the bend of the saw too much at one point as it runs over the wheels. Use a round gullet, as large as practicable, with no sharp corners or abrupt angles.

Never let the back edge of the saw come in contact with the back guard wheel or any other hard

Tension gauge

surface, as case-hardening is bound to ensue from which cracks will surely result. Should the saw be accidentally forced against the guard and case-hardened, remove the glaze at once by holding a piece of soft emery wheel against the back edge while the saw is running slowly. Do not take for granted that the back edge of the saw has not been in contact with the guard wheel. Try a file on the edge of the saw frequently, as only one revolution with the back edge against the guard is necessary to bring about case-hardening. This is done so quickly that it often happens without the knowledge of the operator.

The majority of the large mills are now using the roller or stretching machine for putting in the tension. The desired effect can be attained in a shorter time and with less injury to the saw than if the tension were put in by a hammer. It is necessary, however, to use the hammer for finishing and regulating, after the use of the stretcher.

C. S. Fields Married

We are sure that there are scores of our readers who will congratulate Mr. C. S. Fields, the Canadian representative of the National Dry Kiln Co., on his recent marriage. The young lady involved was formerly Miss Eva Wilson of Toronto. The couple will reside at 7 Jerome Ave., Toronto.

At a meeting of the Hardwood Manufacturers' Institute held in Memphis, Tennessee, Saturday July 29th, S. F. D. Meffley was appointed assistant secretary of the Institute in direct charge of all membership, publicity, advertising, educational and trade extension work. Every manufacturer of hardwoods in the country will be invited to become members of the Institute; all fabricators of lumber will be invited to participate in the co-operative plan in a friendly and earnest endeavor to carry out the standardization program, so that the decreased cost in production, distribution and fabrication may be reflected to the ultimate consumer of the product.

Asphalt and Pitch Paints Efficient Moisture-Proofing Agents for Wood

That some asphalt and pitch paints because of their ease of application and moisture-resistant quality are nearly as efficient as the aluminum-leaf finish now used on airplane propellers, is the evidence obtained by the United States Forest Service in a series of tests which it conducted during the past year in co-operation with the Navy Department at the Forest Products Laboratory, Madison, Wisconsin.

The Navy Department is seeking a moisture-resistant coating of easy application with which to coat seaplanes made of many small wooden parts glued together. On account of the variations in stress resulting from the severe extremes of moisture which a seaplane encounters, it is important to protect the wood with a coating through which the moisture will not penetrate. Otherwise the wood joints may be weakened. Few of the many coating materials already tested have given adequate protection even though several coats were applied. The aluminum-leaf used on airplane propellers is the best moisture-proof coating known, but it is not suitable to apply to the many small and intricate parts which make up the wings and hulls of flying boats.

Some of the asphalt and pitch paints tested were very moisture-resistant, and others were ineffective. Further investigation is to be made to determine the relative value of the different kinds available, and the Forest Products Laboratory, invites the industries concerned to contribute information, suggestions, and samples of paint for use in this study.

When other colors than black are desired, asphalt and pitch paints have been found objectionable, since it is difficult to cover them with paints of a lighter color. It is hoped that this defect can be overcome by developing different methods of applying the final coating.

England Needs Oak Veneers and Plywood

The London journal "Timber," in its plywood section of the July 1 issue made the following interesting comment on the need in Great Britian of oak veneers and plywood:

"Whilst on the subject of veneers, we can still comment on the shortage of figured oak veneers and figured oak plywood, for we understand that the trade is in a position to soak up many times the quantities that are at present arriving. Only a very few bundles of figured oak plywood have been landed for some months, and these have been very quickly absorbed, and the trade have been perfectly content to pay what we consider high prices. Again the question of supply and demand predominates, and this question is becoming more and more apparent every day, especially on such articles as figured oak. What a harvest could be reaped by any supplier who could place on the market to-day a good supply of well-manufactured figured oak plywood. The same thing applies to ash. Although there are a fair number of bundles to be obtained, there is still a shortage of "really good stuff," and with the demand remaining strong, the prices are, and will be for some time, kept at their present level, even if they do not increase. We feel that good ash plywood will be called for by the users to a great degree in the very near future."

British Columbia Woods Make Handsome Trim

Demonstration Suite of Rooms Effectively Displays the Advantages of Western Woods—Exhibit of Great Service to Woodworkers by Interesting the Public in Good Trim Effects

By L. L. Brown*

The beauty and utility of British Columbia woods are being demonstrated in an effective way in the form of a permanent exhibit of a suite of rooms, comprising a living room and a dining room with outside walls and roof complete, which have been built on the ground floor space of the British Columbia Lumber Commissioner's office at 51 Yonge Street, Toronto. This exhibit represents a co-operative effort by the British Columbia provincial government and the lumber and shingle interests of the province, and is not only of interest to architects and builders but also to the manufacturers of wood trim and of lumber products generally.

The whole is a studied attempt to show the people of Eastern Canada the full beauty of British Columbia woods when used in the construction of Canadian homes, for it is felt that the sturdy woods of Canada provide both beauty and strength required for even the most palatial abode.

Heretofore, the intending builder has had to visualize from small samples just how a completed room would appear in these woods, but now even the layman may see at a glance just how beautiful his home may be made by the use of Canadian grown woods. And when he considers that these effects are obtained at about half the cost of using imported hardwoods, he will at once see the advisability of embodying them in his future home. Already a great deal of favorable comment and even astonishment has been expressed by architects, contractors and homebuilders upon the natural beauty of the woods used and their adaptability for even the finest class of homes.

*British Columbia Lumber Commissioner, Toronto.

This illustration shows the attractiveness of Douglas fir panelling

The living room, which is about 13 ft. by 16 ft., is panelled in British Columbia Douglas fir. Flat grain three-ply wood is used in the panels proper and edge grained wood is used for styles and rails and general trim. At one end is a large inviting brick fireplace. The ceiling is beamed and with solid Douglas fir beams with three-ply cottonwood panels between. The room is finished in artistic subdued tones which bring out the natural beauty of the wood to splendid effect.

Passing through an arch, one enters the dining room which is about 12 ft. by 16 ft. 6 in. This room is complete in every way with built-in china cabinets, small bay windows, brick and stone fireplace and French doors. The walls are panelled in Western hemlock; the panels proper being of flat grained solid pieces with edge grained style, rails and trim.

A great deal of surprise concerning this wood is expressed by architects and homebuilders for they have been apt to confuse Western hemlock with the Eastern variety of the same name, which is only used for the roughest work. But a study of this beautiful room shows that Western hemlock has little in common with the Eastern variety for it is a high grade wood, very suitable for interior trim. It is light, straight grained, easily worked and takes a beautiful finish.

British Columbia red cedar beams

are used for the ceiling of the dining room with admirable effect. It shows that red cedar beamed effects are suitable not only for work such as the much admired Music Room at Hart House, University of Toronto, but that this wood is also effective in beautifying the rooms of moderately priced homes. The ceiling is panelled with three-ply cottonwood veneer in a smooth, satin, maple finish. Edge grain Western larch is used for flooring in this room.

Cottonwood panels have been little used in the East as yet for panelling, but their cheapness, quickness of application and ease in finishing to any desired effect will soon make them very popular for panelling halls, dens and dining rooms.

The outer walls of this "house within a house" as it has been called, shows the beautiful effect obtained by the use of British Columbia red cedar shingles. The twenty-four inch Royal grade was used. These shingles have substantial butts one half inch in thickness. They were first treated by being dipped in a Dixie white paint and then laid on the wall with a ten and one half inch exposure to the weather. Afterwards, they were given two coats of Dixie white which gives a splendid effect.

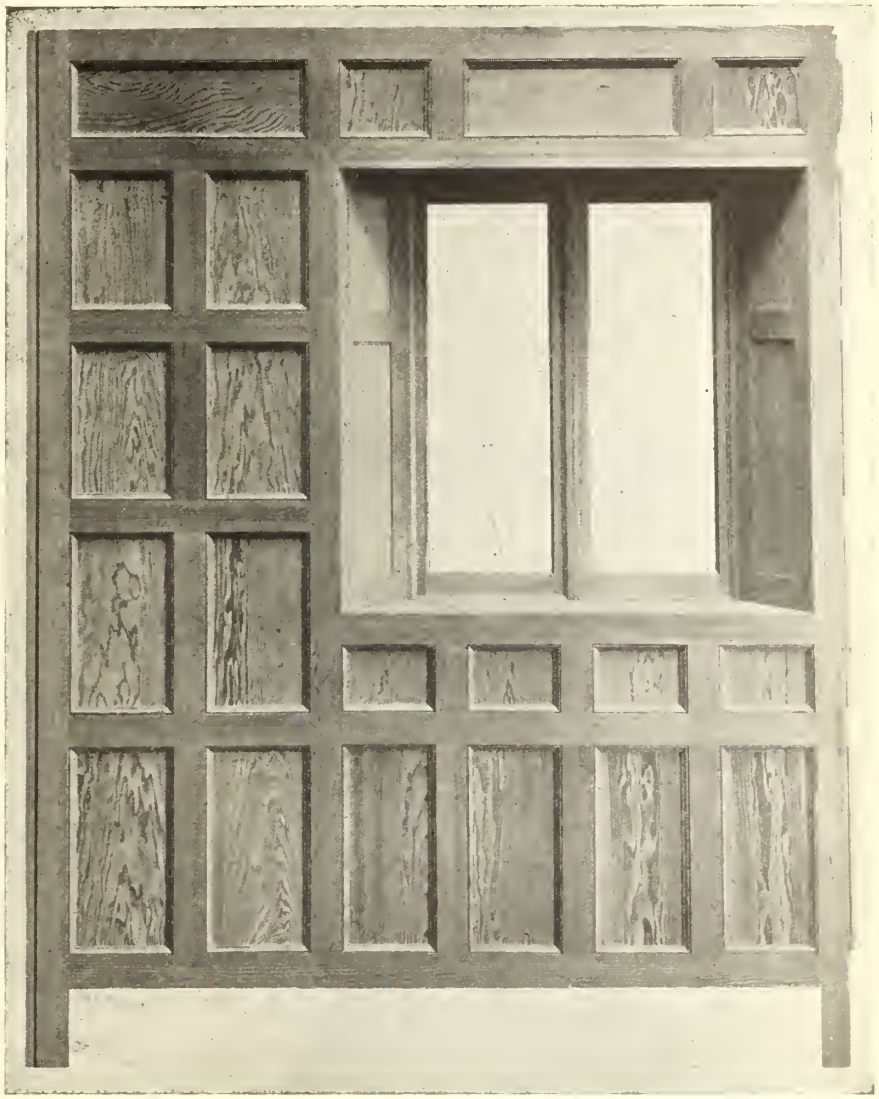
The roof portion is of XXXXX B. C. red cedar shingles with some of them bent to give a thatched roof effect. They were laid with an irregular wavy exposure to the weather. Before laying they were Creo-Dipped in shades of green, red and brown. This gives a pleasing effect when they are laid in alternate colors. As this is one of the first examples of thatched roof effects in shingles to appear in Toronto, it is causing a great deal of interest and favorable comment.

Hot dipped, zinc-coated cut nails were used throughout for laying the shingles. This was done with the hope of influencing architects, contractors and homebuilders to use first class shingle nails. Too often it has been found that the ordinary wire shingle nail does not give a service nearly equal to the life of the shingles. In this connection it may be noted that already a large number of progressive retail lumbermen are carrying a zinc-coated shingle nail which gives excellent results at a very small additional cost, indeed, so small as to be negligible when the additional life of the roof is considered.

Western white pine was used for the exterior finish and proved itself highly adaptable to the somewhat delicate detail required for trim around the main entrance door.

The rooms are completely furnished with Canadian made furniture and all lighting fixtures are installed just as they might be in any home of good taste.

The cumulative effect of the whole has resulted in an exhibit which will have a great educational effect on Ontario homebuilders in the use of good Canadian grown woods for Canadian homes.



Exterior window and panelling in Western hemlock

It is hoped that this exibit will be of great service to woodworkers and manufacturers of interior trim by showing the powerful effect of such a finished exhibit as an advertising and selling force. The propaganda of the manufacturers of substitutes must in time have a serious effect on the lumber and mill business in general unless counteracted, and it would seem that there is no better way to sell wood products than by showing the people what can be done with wood. Finished rooms or suites as that now completed for the British Columbia forest industries comprise a splendid way of convincing even the most exacting homebuilder just what can be done with native grown lumber.

Grading of B. C. Woods

Another exhibit now under way at the same address as the exhibit just described is a "Grading Exhibit of British Columbia Woods." At the present time very few architects or engineers clearly specify lumber according to actual grades and many are the misunderstandings and disputes which arise from this

incomplete method of specifying. In order to overcome this and to show the actual grading of British Columbia woods, it is proposed to place on exhibit several pieces of each grade manufactured. Different sizes will be shown framed in convenient display racks. All pieces will be about ten feet in length, so that an excellent idea of grades can be obtained by the architect or engineer before specifying.

The same will apply to shingles, for market extension men have found that there is room for considerable educational work amongst architects in the right specifying of shingles. Few of them are aware that there are other grades than XX and XXX red cedar shingles and they are always astonished and

Built-in china cabinet and panelling in Western hemlock

pleased when shown XXXXX, Perfections and Royals as manufactured in British Columbia. In this exhibit all grades will be shown which will be of great help to architects and homebuilders in solving the important problem of a durable roof.

The old time, easy methods of obtaining orders for wood trim have had to bow to inevitable progress, and clean cut selling methods, backed by service, are now recognized as necessary by all millmen. In this connection display of woods embodied in the structural and finished portions of life-size rooms should prove weighty factors in the distribution of good wood trim. The keen interest already shown in the pioneer built-in exhibit of the British Columbia forestry service bears this out to the letter. Just as architects and homebuilders have always studied the finished effect of the past domestic architecture of all ages in search of the beautiful for their own creations, even so will they study with satisfaction the finished design as shown in room and suite exhibits, When they are interested to the point of desire they are more than half sold.

Standardization of Sash and Door Stock

The attitude of sash and door manufacturers of the United States toward the lumber standardization movement is expressed in a formal statement issued by the Wholesale Sash and Door Association and submitted at the meeting of the National Lumber Manufacturers Association held on July 20-22 in Chicago to discuss standardization matters. The report reads as follows:

"First, we are in sympathy with the grading of all lumber under national supervision and any other constructive work which will make the activities of the scalawag more difficult.

"Second we are concerned especially with the thickness and grades of factory plank, known better as shop lumber, in the grades of Nos. 1, 2 and 3 shop and third clear. We would be opposed to any change in the grading rules applicable to these four grades. We also would oppose strenuously and wish to impress upon you the mighty seriousness of a change in the standard thicknesses now in effect. The 4/4 shop standard thickness is 13/16 from some territories and 25/32 from others. This we should like to see standardized at 13/16, thereby permitting the furnishing of mouldings and cupboard doors ¾-inch thick to better advantage than now being done when there is but only 1/32 on which to work. The standard thickness of 5/4, 6/4 and 8/4 lumber should, in our opinion, be left where it is at 1-5/32, 1-13/32 and 1-25/32 respectively.

"Third, we have no fault to find with the present standard thicknesses of hardwood lumber or 4/4 yellow pine and fir. We should, however, like to see 5/4, 6/4 and 8/4 yellow pine finish furnished surfaced two sides to 1-5/32, 1-13/32 1-25/32 respectively. Under the present standard thicknesses, we are unable to furnish 1⅛-inch cupboard doors or 1⅜-inch or 1¾-inch standard doors without having lumber cut especially for the purpose. In manufacturing 1⅛-inch doors and 1⅜-inch doors, it is necessary to use 1¼ and 2-inch lumber respectively. We should like to see the rules modified so that yellow pine finish would be available to sash and door manufacturers in the same thicknesses as the western pine, thereby permitting a greater use of this particular wood. These remarks regarding yellow pine apply perhaps to a greater extent to fir."

U. S. Toy Manufactures Meet

The Toy Manufacturers of the U. S. A. held their midsummer meeting at Manchester, N. H., on July 20 with an attendance of nearly 100 manufacturers of toys from all parts of the country. A review of conditions indicated a bright outlook for the industry, although some fears were expressed that German competition would affect the American trade because of the low cost and in spite of the high tariff.

Public Confidence in the Furniture Industry

The Adoption of Standard Furniture Designations Will Help to Eliminate Unscrupulous Dealings and Unfair Competition—A New Set of Names Drawn Up by Associated Advertising Clubs, Broadcasted to Retailers

Fifteen thousand furniture retailers have recently received from the Retail Furniture Association of the United States a circular describing the standard furniture names recommended by the National Vigilance Committee of the Associated Advertising Clubs of the World. The definitions embodied in this circular are those under which this committee believe it ethical for the retailers to sell furniture.

Accurate and uniform names for the various classes of furniture have long been desired by far-sighted men in the industry. There has been a need for them, not that there has been an unusual amount of confidence-destroying and unfair practice in the furniture business, but there has been enough to make it important that the public be given a dependable guide to furniture descriptions, and that legitimate merchants be provided with a standard to which they can rally—a basis of confidence-building practice on which better business may be permanently built.

In the formulation of the standard furniture names, consumers, retailers and manufacturers have been consulted and the authoritative character of the recommendations gains by the fact that they are based substantially on terms proposed by the National Council of Furniture Associations for the use of manufacturers. The recommendations are as follows:—

SOLID—Furniture designated as solid mahogany or walnut shall have all exposed surfaces of solid wood of the kind designated.

MAHOGANY OR WALNUT—Furniture designated as mahogany or walnut shall have all exposed surfaces (both solid parts and plywood) of the kind of wood designated.

COMBINATION—Furniture designated as combination mahogany or walnut shall have all exposed surfaces of mahogany or walnut (solid or plywood) in combination with gum, birch, or other suitable wood.

The kinds of woods used in combination with mahogany or walnut should be named, for example: "Combination mahogany and birch," "Combination walnut and gum."

IMITATION—Furniture designated as imitation mahogany or walnut shall be that with exposed surfaces of other woods colored to imitate mahogany or walnut.

Where other woods are used, the name of this wood is to be substituted for that of mahogany or walnut in the definitions.

The term "exposed surfaces" shall mean those parts of a piece of furniture which are exposed to view when the piece is placed in the generally accepted position for use in the home.

Manufacturers of furniture are much interested in any movement that attempts to standardize the names under which their products are sold. All too often the terms used have been the basis for promoting misunderstanding between a store and its customers, or have been a harmful instrument of unfair competition. They have given the unscrupulous dealer undue advantage over the honorable retailer, and, in many cases, have undermined public confidence in the furniture business.

Unscrupulous Retailing

We do not believe that among honest and scrupulous furniture retailers there has been any attempt to wilfully deceive the public but there have been instances where some have designated on their invoices a combination suite or an imitation suite as "mahogany" or as "walnut," largely because of custom. Some retailers, too, attempt to obtain a greater profit than is warranted by the cost of the suite or article, by selling it as "solid mahogany" or solid walnut," and, if caught, have tried to justify themselves by saying "We did not know. It was billed to us as mahogany." Thus they try to pass off the fraud on the manufacturer. Of course the manufacturer may not claim responsibility for what the retailer tells his customers. Some, indeed, claim that they are not interested in how or by what means their products are retailed. However, those manufacturers who wish to improve the status of the industry and create public confidence in furniture and the makers of furniture, have an interest in seeing that the public's faith is not undermined. Any attempt, therefore, to standardize furniture names and induce retailers to employ them in their sales talk, should meet with the hearty approval of the manufacturers and be enthusiastically encouraged by them.

When retailers advertise their wares they should be careful to use the proper standard term that sufficiently designates the type of furniture in question. No juggling of expressions or laxity in description should be permitted. In fact, it was from the advertising viewpoint that the National Vigilance Committee of the Associated Advertising Clubs took up the matter of standard furniture names. Their object is to promote truth in advertising—a policy that deserves encouragement on the part of every manufacturer, jobber or retailer. In the furniture field the manufacturer can lend his assistance by seeing to it that his own advertising is quite clear of any misuse of descriptive language.

The Manufacturers' Part

We have seen it urged that manufacturers should print on the front page of their catalogues a heading somewhat as follows:—"We have adopted for our own use the trade names printed below. This is done that there may be no misunderstanding as to the construction of the furniture that we ship to our customers." Then follows the list of terms as printed in a previous paragraph. This is just one scheme by which the manufacturers can indicate to their customers that they are in accord with truthful descriptions of their products and are not willing to condone inadequate descriptions or deliberate falsehoods.

The publicity that is being given to the standard furniture names through the distribution of explanatory circulars to 15,000 retailers is bound to have an improving effect on retailing methods. It must not be thought, however, that in the marketing of furniture, there is any great degree of unscrupulousness; in fact we are confident that the great majority of furniture merchants are not taking any undue advantage of their clientele, thanks in no small degree to the high quality of the furniture turned out by a vast percentage of the factories throughout the country.

How to Handsomely Increase Your Profits

Make Use of the Vastly Improved Equipment that is Offered the Woodworker To-day—Modern Machines Show Remarkable Developments that Produce Better Work at Lower Cost—The Value of Bench Outfits

By D. L. Clarke

To those who have followed in a more or less casual manner, the changes which have been brought about in the design and development of woodworking equipment during recent years, the refinements and improvements which have actually been made will prove little short of a revelation. It is not enough to know that such and such a machine is on the market or that so and so is bringing out some new equipment. To keep really abreast of the times it is necessary to make a detailed study of all new developments in this particular field and learn in detail just where and how the various improvements have been made.

While this naturally will require a certain amount of time and effort, yet it will be time well spent. Not only that but to the woodworker who is progressive and who is entensely interested in his work such a practice should be a real pleasure, a sort of pleasant pastime, as it were.

Without attempting a detailed analysis of the design and application of modern woodworking tools it might be of interest to touch lightly on some of the changes which are found. The development and improvement which has occurred in this line may be divided, broadly, into four divisions.

First: Improvements tending toward increased output and better work.

Second: Equipment for the automatic quantity reproduction of parts or articles that were formerly produced by hand operations.

Third: Greater attention to design construction and workmanship.

Fourth: Refinements that tend to facilitate operation, lighten the work of the operator and also tend toward greater comfort for the operator.

How Output Has Been Increased

Enlarging on these divisions, briefly, the trend toward increased output and smoother, better work has been brought about largely by faster feed speeds, made possible through increased cutter head speeds, more cutters per head, grinding and jointing attachments and greater weight and rigidity to the machines, and also through the perfection of double end equipment such as tenoners, cut-off and mitre saws and further with multiple spindle mortising and boring equipment. Better quality work leads in turn to increased output in other directions for improving the quality of the output of the planer and sticker, means that less sanding is required and up goes the output of the sanding department. Similarly the increased accuracy of the work of the double-end machines eliminates much of the fitting so often found necessary and thus facilitates the movement of work through the assembling department and so on down through the whole list of woodworking operations.

In the second division would be found such machines as automatic turning lathes, leg-forming equipment and special automatic sanding machines such as for turnings and mouldings. This outline would hardly be complete if some reference were not made to automatic screw driving and portable screw-driving and boring equipment. Here again hand operations are eliminated and productions raised.

Better Designed Machines

Under the third heading some startling innovations have been made. Whereas, formerly little attention was paid to the manufacture of woodworking machinery, to-day the same care and workmanship is exercised that goes into the better class metal-working equipment. This has resulted in machines that are pleasing to the eye, particularly to those who appreciate good workmanship, but more to the point is the fact that such machines work with a degree of precision and accuracy that was lacking in most of the equipment made a few years ago. In design, greater attention is being paid to rigidity so as to eliminate as much vibration as possible. Not only is vibration a hindrance to the production of smooth work but it shortens the life of the equipment to an appreciable extent. For this reason solid, well-built equipment can be depended upon for better work and to give longer service and as a result is cheaper in the long run.

The fourth division was given as, "refinements that tend to facilitate operations, lighten the work of the operator and that also tends toward increased comfort for the operator." This has to do with the placing of operating levers, provision for changing adjustments, shifting belts, etc. An attempt is made to have everything right at hand and in a convenient position so that excessive stooping and awkward positions may be avoided. In some cases power adjustments have replaced hand levers and wheels. All this facilitates the operation of the machine and tends to raise production.

The Operator's Comfort

The comfort of the operator is considered by the placing of the operating and adjustment controls and also by the provision made for carrying away the dust and shavings. This latter feature is receiving more and more attention with each passing day. Some of the newer belt sanders, for instance, have one end completely hooded in with a suitable connection to the shaving exhaust system. While there may not be anything new in this idea, the thoroughness of its application is unusual and marks a new step in this direction. The same applies to the attention being given to the collection of dust and shavings on other equipment, even on such machines as jig saws and bandsaws.

Other phases of woodworking machine development might be touched on if space permitted, such as the application of ball-bearings, which is becoming quite general, and the economies in power, repairs and lost time thus effected, also the development of light portable machines of various types. The idea of replacing hand work by providing light equipment which may be taken right to the bench, appears to be only in its infancy. The idea is basic and

offers a chance for real economies in assembling and hand operations.

Summing it all up, the woodworker is to-day offered many opportunities for improving the quality of his output, increasing production and reducing costs through the purchase and operation of modern types of equipment. At first glance the cost of making such changes may seem high, but the results which would be achieved would more than justify the expenditure. This was put very aptly by a writer in the June "Canadian Woodworker," who stated that the only basis upon which to judge the value of any machine is not the initial price, but its productiveness and the quality of its output. On this basis, there should be a rush for new and improved machines, for an investment in modern tools will be returned in a few months and a handsome profit will result for years afterward.

What is Wrong with these Cost Figures?

Wide Variations in Certain Factors Indicate the Need for Improvement in the Method of Taking Off Quantities and Estimating Costs—What Effect Has Delivery on the Cost?

The cost study for this month involves three doors in whitewood, a problem that has been submitted to us by a mill operator who had this order on his books a short while ago. He was very interested in determining just how his figures compared with estimates of other millmen; consequently we asked in our June issue for cost estimates on this order. The half dozen or so figures tabulated below are the result, and they are seen to afford an interesting comparison and teach several important lessons.

In this instance there is not the same variation in the total cost that has been apparent in some of our other cost studies. The range is from $63.44 to $69.54, which might seem to indicate that the basis of cost is about the same for all the estimators. An investigation, however, of the various factors involved in the total cost shows wide discrepancies and indicates that there is still need for the adoption of more reliable costing methods.

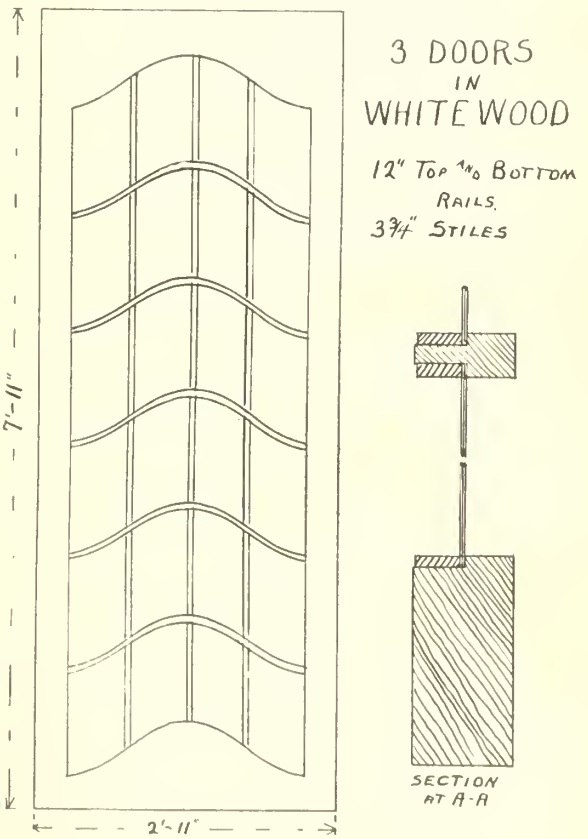
Estimate of Cost of Special Door Order

No.	Material	Waste	Bench hrs.	Rate	Machine hrs.	Rate	Commercial Burden	Total
1	$17.50	10%	9	$ .85	21	$1.00	10 %	$63.44
2	18.05	20%	19	1.00	8	1.50	20 %	64.62
3	13.56	20%	15	.85	10½	1.07	20 %	65.09
4	12.25	10%	12	.85	25	1.10	12½%	65.65
5	20.05	15%	24	.90	6	1.50	15 %	67.22
6	14.35	10%	3	.90	10	2.00	25 %	67.49
7	18.75	25%	16½	1.00	7½	1.25	15 %	69.54

Who is Right?

The first factor is the material, and here there is considerable variation in the figures—about 60%. Possibly this is due to the fact that as one man told us, 20% of the planing mill men do not know the correct price of whitewood. The figures we have received certainly show considerable discrepancy in the quoted price of whitewood, but furthermore there appears to be no uniformity in the estimates of the amount of material required. One millman figures as low as 63 feet and another as high as 140 feet. It is obvious that some of the estimators need some lessons in the taking off of quantities.

The labor hours, both bench and machine, show some startling discrepancies, the bench hours varying from 3 to 24, and the machine hours from 6 to 21.



The subject of cost study for this issue

Again, it is obvious that there is no justification for such variation in the estimates. Making all due allowance for the differences in the equipment and method of handling this order on the part of individual manufacturers, there is no reasonable excuse for the discrepancy that is indicated by the figures—a case again where millmen are not sufficiently well acquainted with the costs on previous work to be able to make an estimate with reasonable assurance of hitting the mark.

The importance of waste in an estimate of this character is emphasized in a letter which accompanied one of the cost figures which was submitted to us. This stated: "Waste is in a measure still the un

known quantity. This will be governed by the grade of lumber bought or available, and the availability of opportunities to use what would otherwise be waste. Hence we think the great difference in either estimates or guesses." The word "guesses" in this comment about expresses the true situation as far as many of the estimates in these cost studies are concerned. However, it is just to help in eliminating such guesswork that the "Canadian Woodworker" has carried out the policy of a monthly cost study. It is undoubtedly having a beneficial effect, if we are to judge by letteres of commendation that continually reach us. Several letters this month have stated that the mills concerned appreciate the good work that is being done through the medium of these cost studies, and urge us to continue our efforts toward putting the millwork business on a better footing as far as its costs are concerned.

The Effect of Service

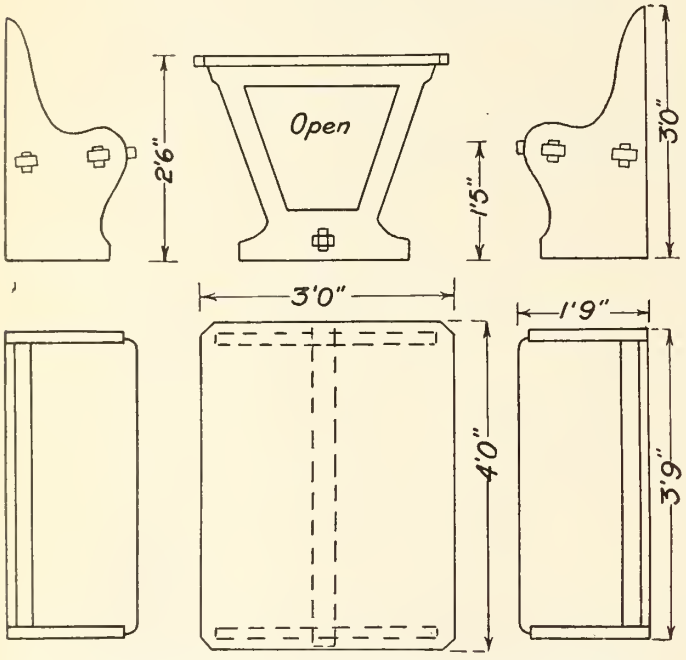
In connection with these cost studies many important points come to light. One such point is emphasized in one letter in which the writer, a prominent Ontario manufacturer of stock lines, comments thus:—"At some future time we hope you will take up the question of 'what effect has prompt delivery or service in connection with such matters-' Very often it has a very direct bearing on costs as well as on the satisfaction of the customer. Buyers will shop around for a month or so and then expect delivery on a few days' notice. Evidently they have not yet learned that a factory should be booked ahead and that other people require orders filled. This is and has been a long-standing trouble." Will our readers not take up this question and write their opinions for publication in the "Canadian Woodworker?" An important point is brought up in the comment quoted above and there is nothing like a frank expression of opinion to clear the difficulty up.

It would be interesting to compare the figures listed with those submitted by the firm that actually handled this order. The doors which they made were 1¾ inches thick while those on which this cost study is based, are 1⅜ inches. However, there would be little difference in the price. The following is the actual cost:—

Material, 140 feet whitewood at 15 cents ..	$21.00
20% waste	4.20
7 machine hours at $1.10	7.70
66 bench hours at .85	56.10
Total cost	$89.00

For the September issue we have taken a breakfast nook set, including a table and a pair of seats, such as are used in breakfast rooms in many modern houses. This is, perhaps, a little simpler order than we have been running in the series of late, but it is in response to an appeal from several millmen who ask for something that is more frequently handled by the average planing mill. We hope that this will bring ont an unusually large number of replies. Please submit your idea of the cost at the earliest opportunity.

What Can You Make this Job For?



Send in your estimate of cost of this breakfast nook set and compare it with the other fellow's. The figures will appear in the September issue

National Lumber Manufacturers' Association Discuss Standardization

What is regarded as a step forward in the standardization of lumber sizes among lumber manufacturers was developed at the second general conference, held under the auspices of the National Lumber Manufacturers' Association, at the Congress Hotel, Chicago, on July 20, 21 and 22. Prior to the series of conference that were called for Chicago, there had been held during the previous week at the Forest Products Laboratory at Madison, Wis., a conference of experts which formulated a plan of procedure, or rather a set of tentative rules for the standardization and grading of softwoods.

At the Chicago meeting, an addition covering hardwoods was made to the Madison report as follows:

It is recommended that:

(1) A complete engineering survey be made to determine if grades can not be constructed to more closely meet present consuming requirements.

(2) The present hardwood grades be divided into the three general classes recommended by the Washington conference; and it is suggested that this division of the present grades be made as follows: A—To include those grades which are practically clear or are determined by a limited number of enumerated defects of minor character; B—To include those grades which are determined by clear or clear face cuttings; C—To include those grades which are intended for uses where reasonable strength is required, and where certain percentage of sound cuttings is the determining factor.

(3) In the event a revision or reconstruction of grade specifications is found to be necessary from the survey that is recommended, the same general division can apply to the revised or reconstructed grades.

However, as the conference was not empowered to adopt or reject anything, but could merely receive and consider opinions on matters relating to the standardization program, no action was taken on these recommendations.

Edison has said that the day will come when no human hand will touch a piece of work that can be done by machinery.

Up to a Standard, Yet Down to a Price

Designing a Crate for a Special Purpose, Where Strength was Essential but Price was also an Important Factor—The Three-Way Notched Design Showed a High Degree of Rigidity and Saved Labor in Assembling

By J. R. Watkins

The laboratory engineers are often called upon to design a low-priced box or crate, and although they are not always requested to produce a stronger box at less cost than had been used, it is their desire to combine these essentials. Nor does their work end with the box or crate design. Whenever possible, they make a study of the box assembling, and this often calls for designs of nailing forms to expedite the nailing up and packing.

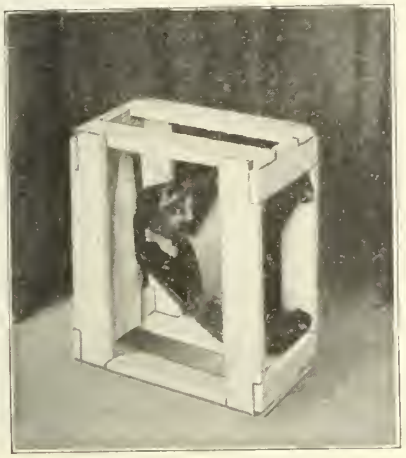


Fig. 1—The three-way notched corner crate for automobile transmission case

Just such a service which was performed a few months ago at the laboratory of the Chicago Mill and Lumber Co., Chicago, in response to a letter of inquiry to the sales department for prices on fifty thousand boxes for carrying automobile transmission cases, is described in "Boxes," the house organ of the company. The customer did not know just what he wanted. He needed a low-priced box that would carry the transmission cases safely, but left the details of construction to us. He did, however, suggest using a certain type of box because he had been led to believe that it was the lowest priced box obtainable for this particular service.

A Visit to the Plant

The sales manager turned the problem over to the research department and requested that an engineer be sent to study the problem. At the customer's plant it was developed that the box of the particular type desired was estimated to cost twenty-eight cents. In making his bid on the contract, the customer had used an estimated price of twenty cents, and any amount in excess would mean a loss upon the contract. Consequently the problem was a satisfactory package at a cost not to exceed twenty cents.

The outcome of the study was a nailed crate which cost fourteen cents for material and three cents for assembly, making a total cost of seventeen cents.

In view of the production outlined by the customer's engineer, it was necessary that something in the way of a nailing form be designed to expedite shipping.

How the Study was Made

The weakest part of a crate constructed of fairly clear lumber is at the corners where three frame members meet. It is possible to join the three frame members at the corner sixteen different ways, any one of which would be a three-way construction. The three-way corner which gives the greatest efficiency is one in which each member is nailed to another member and has a third member nailed to it. It is a common type but its value is not appreciated by some, as is evidenced by the many examples of crates of inferior yet more expensive construction found in freight houses.

Designing for Rigidity

The ordinary three-way construction is not always 100 per cent efficient, and it is frequently necessary to add diagonals in order to get a balanced crate. But diagonals run the cost up, and where cost is the controlling factor, it becomes necessary to try another line of attack in designing for rigidity.

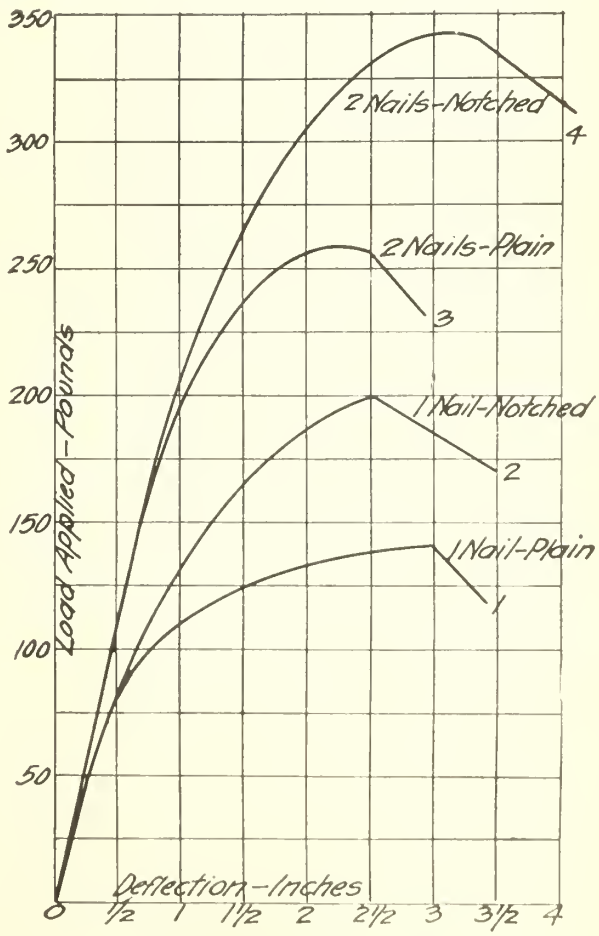


Chart of curves, showing additional strength obtained by using the notched corner

Our attack centred on the weakest part of the crate and the three-way notched corner construction shown in Fig. 1 was a step toward the more efficient construction which we needed.

Compression Tests

Just how much rigidity was added by the notched construction is clearly shown in the curves of the accompanying chart. These curves were obtained from the cornerwise compression tests of crates with and without notched corners, and with one and two nails in each member of the crate at the corner. The materials used were 3 x 5/8 inch lumber, and 5-penny cement coated nails. Fig. 2 shows the method of conducting the test. The load was applied at the corner and in the direction of a line passing through a point at the centre of the crate.

In these curves the maximum load was reached at a deflection of approximately 2½ inches. The difference in maximum loads of curves No. 2 and No. 1 and curves No. 4 and No. 3 is about the same, it being 63 and 73 lbs., respectively. This increased load was taken by the notch. In the one-nail crate the strength was increased by 46 per cent, and in the two-nail crate, 28 per cent.

The Notch Eliminates Strain on Nails

There are other features about the notched construction that are highly desirable in crates. A study

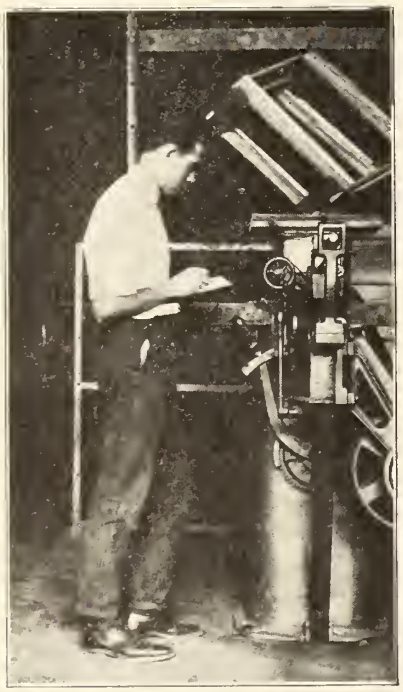


Fig. 2—Applying the load in corner compression

of Fig. 1 will show that the notch provides a shoulder upon which rests the adjacent member, and when the nails are driven there is no tendency to bend nails which already been driven, because the blow of the hammer is taken by the shoulder.

The principal factor of strength desired in this crate is resistance to loads piled on top of it. The notched corner is especially adaptable for this, because all the weight is taken by the notches and none by the nails.

How Nails Were Saved

Having obtained a crate of increased strength by means of the notch, we began to investigate the possibility of saving nails. Again referring to the chart and curves No. 2 and No. 3, it will be seen that the notched corner with one nail is approximately 80 per cent as strong as the regular three-way corner with two nails.

The article to be crated was a casting, and could take a considerable amount of the rough handling incurred by the package without damage. But a large per cent of the cases were to be shipped in carlots and, consequently would not receive the rough handling of less than carload shipments.

In view of the limited handling the crate would undergo, and the fact that a notched three-way cor-

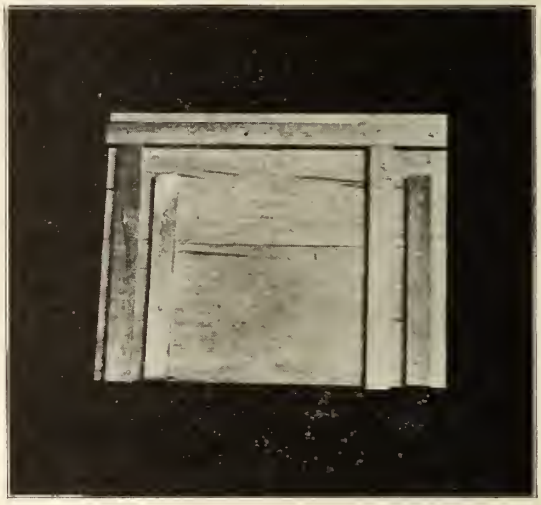


Fig. 3—Nailing form that saves time and labor

ner with one nail is 80 per cent as strong as the regular three-way with two nails, it was decided to use one nail in the corner construction. By doing this, the number of nails was cut down 50 per cent and at the same time 50 per cent of the labor of nailing was saved.

Tools for Engraving Metals

Poulamond, N. S.,

Editor, "Canadian Woodworker."

Can you tell me where I can secure some engravers' tools for doing some fine letter work on metal?

Sincerely yours,
Chas. N. Pertus.

As far as we can ascertain engravers' tools are neither manufactured nor handled in Canada. If you will write any one of the following firms, it is just possible that they will be able to take care of your requirements. Acme Diamond Tool Co., New York City, N. Y.; Wm. Dixon, Incorporated, New York City, N. Y.; Hammel Riglander Co., New York City, N. Y.; or Sussfald, Lorsch & Co., New York City, N. Y.

The new Coliseum at the Canadian National Exhibition is the largest and most costly building ever erected on a permanent Fair grounds. It cost $1,000,000, while an additional $250,000 is being spent in equipment.

Machinery & Equipment

Jig Saw With New Features

The Oliver Machinery Co., Grand Rapids, Mich., have just placed on the market the Oliver No. 173 self-contained jig saw, which is claimed to be a radical departure from anything heretofore offered for scroll saw-work. The object of this machine is to do jig or scroll sawing in wood for such kinds of interior and exterior scroll work as occur in furniture-making, cabinet-making, musical instrument shops and, indeed, all plants where irregular sawn wood

Oliver No. 173 jig saw

is used. The unusual features of the machines are the absence of overhead mechanism, the guarding of all moving parts and the lack of tension in the saw blade.

The saw has capacity operating from the front of the machine up to 36½" between the saw and the column, but the saw may be operated from the side, that is, the saw turned at 90 degrees, so that work of almost any length or practical width may be sawn. The highest work that can be taken under the guide is 10". The stroke of the saw blade itself is 3" and saws up to 18" may be used. All moving parts are very carefully guarded, and the saw is operated without tension in the blade so that a broken blade will not be likely to cause an accident.

The convenience in inserting saw blades in place appeals to the operator because the saw can be removed and replaced in very little time. The clamping device below the table is automatic and the sliding block in the upper guide way provides a very rapid and convenient method for inserting the saw. Saws may be turned ¼ way around operating standing against side on machine or at the front of the machine thus increasing, very materially, the length and width of stock that may be worked on this machine.

There is no overbalance load which insures a steady, quiet running, vibrationless machine resulting in fine and better work.

The jig saw is self contained when belt driven as well as when motor driven. All parts are made interchangeable and all bearings and movable parts are made to compensate for wear. The pitman and the cross head are made of aluminum which is light in weight yet very rigid. Complete and easy control of the machine is obtained by means of a foot lever located conveniently for the operator.

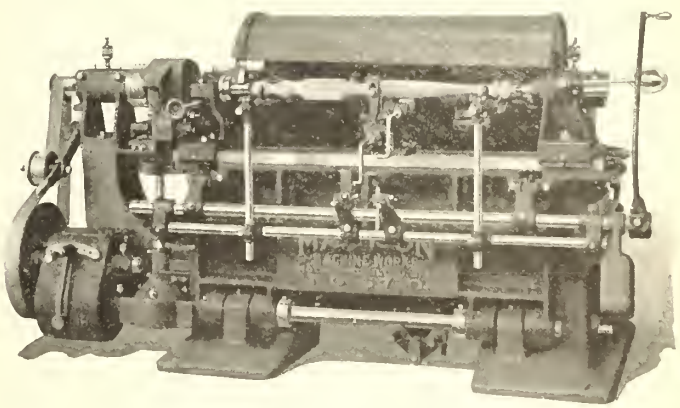
The slide dumping device in the table in front of and around the saw, with a knob on the under side, may be drawn back to permit small cuttings to drop through the table and out of the way when doing intricate interior scroll work. A continuous flow of air is directed to the front of the saw.

The table is of cast iron, strongly ribbed, size 30" x 34", mounted on rockers so as to tilt 30 degrees to the right and to the left. It may be locked in any position by means of clamp screw and hand wheel.

When direct motor driven a flexible coupling is mounted on the shaft for direct connection to the motor. The speed of the shaft is 1,200 r.p.m.

New Automatic Shaping Lathe

The illustration herewith shows the new model 57-D Mattison automatic shaping lathe being marketed by the Mattison Machine Works, Rockford, Ill. This new model lathe has been completely re-designed from the ground up. Even the main base is brand new, being made heavier and more rigid than it was before, with better provision for getting the shavings away, providing more room and better clearance for the various attachments, etc. Main bearings have



The 57 D Mattison automatic shaping lathe

been improved by making them longer and heavier, providing larger oil chambers and adding drip oilers.

The five-step cone feed pulley requiring the drive to come from a countershaft or jackshaft has been done away with by substituting a single pulley with belt tightener. Sliding gears running in a bath of oil provide the speed changes for the feed. The speed of the feed shaft and bevel gears connected to upright shaft, has been cut in half, reducing wear and giving smoother running. The head stock gears are placed in permanent adjustment before they leave the factory and never have to be disturbed or interchanged when substituting work-holding devices, thus eliminating the danger of getting these gears out of adjustment and causing undue wear. The car-

riage is heavier, yet better balanced, and easier to handle.

The hollow chuck attachment has been greatly improved and simplified, and not only can be operated faster, but can be easily removed or attached by one man. An automatic centering device is provided when the head centre is used in combination with the chuck. This combination makes for quicker handling and also saves stock on a great many styles of turnings. The chuck is mounted on an extension plate which permits of using the regular tail stock in combination where it is desirable on certain classes of work. New locking device on chuck jaws allows stock to be revolved in either direction without danger of the grip loosening. The dust hood has been improved and is now provided with a movable damper which can be set to confine the suction to just the length of cut being taken.

Many other refinements along the line of those mentioned have been applied, which go to make the machine easier and quicker to handle, increasing capacity, eliminating.

Westinghouse Motor Starters

Of interest to woodworking plants using electric drive is a line of motor starters, affording complete protection to the operator and the motor which has been developed by the Westinghouse Electric & Manufacturing Company. These starters are fully described in a publication, folder 4,500, recently issued by the Westinghouse Company. Altogether there are four types (WK-10, 20, 30, and 100) of these starters with capacities ranging from the smallest motor up to those of 15 h.p., 550 volts. The mechanism of each type differs somewhat from that of other types, but the chief features of safety and reliability are common to them all.

The construction of these starters is extremely simple, their first cost is low, and, at the same time, they possess many protective features. All of them are equipped with a device for locking the switch in the "off" position to protect those working on the machines. A door, which is so interlocked with the switch mechanism that it can be opened only when the switch is in the "off" position, covers those parts requiring inspection and occasional renewal.

The motor is protected from overload, both when starting and while running, by means of time-limit thermal cutouts or relays. The time lag of these thermal cutouts allows reasonably high starting currents or momentary overloads which do no damage to the motors. When subjected, however, to a continuous overload sufficient to overheat or damage the motor, the outlets or relays serve to quickly open the circuit. The capacity of each starter can be changed within its range by substituting the proper thermal relays or cutouts.

Since the switches are quick-make and quick-break, they can easily break the locked current of the largest motor having a normal current within the limit of the rating of the switches. All these starters are of the single-throw type, the motor being started by turning the switch to the "on" position and stopped by turning it to the "off" position. The entire switching mechanism can be inspected by removing the screws that hold on the cover, and the switch can be removed and renewed from the front without disturbing the box of circuits.

The Latest in Kilns at the Forest Products Laboratory

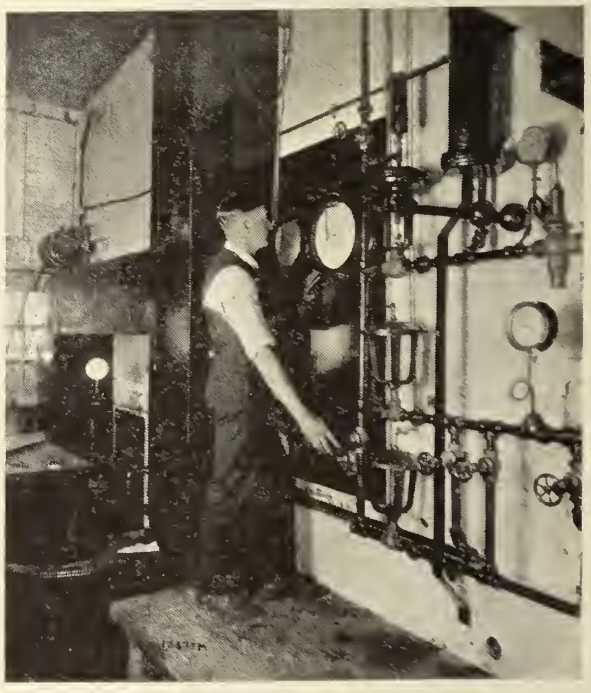
The new kilns at the Forest Products Laboratory, with which the action of any commercial type of kiln may be reproduced, will be of special interest to those taking the kiln drying course at that institution.

Each of the three fundamental factors in drying wood, moisture, heat, and circulation, is perfectly and easily controlled, not only for duplicating any particular type of kiln-drying action, but for any modification that the experimenter may wish to try out.

The new kiln, while built for experimental purposes, is a regular sized unit intended for practical work under any condition which may be met in commercial operation. The kiln is not so much for comparing the relative efficiency of different types as to make possible studies by which these various types may be improved and the best drying rates worked out. It is intended also to use the kiln as a demonstrator in the courses of dry kiln operation.

In designing the kiln, special attention was given to the production and control of the air circulation; two types, internal and external, of blower or forced draught equipment, are provided, and further control is possible with the series of air ducts, dampers, and vents.

The four internal blowers are all mounted on one shaft below the lumber and are driven by a motor located outside the kiln. Heating coils are on either side of the blowers. Reversing the motor reverses



Operating room of the new demonstration kiln at the Forest Products Laboratory

the action of the blowers so that the air may be either forced inward through the lumber or drawn outward. The course of the air is further directed and made more uniform with a special arrangement of baffles and air distributors. This reversal of circulation produces more uniform drying with less power and in less time than is possible with a non-reversing circulation. The internal fans are particu-

(Continued on page 96)

Upholstering and Trimming

Application of Down as a Top Stuffing

Thin Quilted Pad of Down Over Springs and Hair is Advantageous—May Be Used on Any Chair of Roomy Dimensions

The chair frame, illustrated in fig. 125, introduces a new theory of comfort into the discussion of the application of down as a top stuffing. This chair is upholstered in the early stages in all respects the same as the one described in connection with fig. 118 in the June issue, in which the previous article of this series, reprinted from "The Upholsterer," is published.

The seat has a spring edge built up in the usual way with a very soft stitched edge and hair understuffing. No description, therefore, need be given in connection with figs. 126 and 127, nor is it necessary to describe the placing of the pillow springs in the back and the soft upholstering of hair which overlays the springs.

Fig. 128 shows a quilted pad of down attached to the back as a top stuffing. This pad, which is thin, is made knife-edged, that is, without inserted borders, and is filled with a very light filling of down and either tied at intervals to prevent shifting of the down, as shown in fig. 131, or sewn across by means of a sewing machine, with a very slack top-thread tension, creating a loose type of quilting, as shown in fig. 132.

This pad, as indicated in fig. 128, is tacked over the under-stuffing to make a soft surface next to the cover. It goes without saying that for a surface of this kind the cover must be left fairly slack, so that the fluffing of the down will fill it comfortably, but always avoiding that degree of tightness which would nullify the advantages of employing the down pad.

The arms and wings are double-stuffed very softly and built up as shown in fig. 129. Over this is placed a light padding of hair, as shown in fig. 130. The down-filled pads, similar to those shown in figs. 131 and 132, are made a little over size, that is, the pad for the wing would be made about one inch wider than the actual size of the wing, and that for the arm possibly two inches over size each way. These are then attached, as shown in fig. 133, in such a way that there shall be no wrinkles that will be perceptible under the covering but retaining so far as

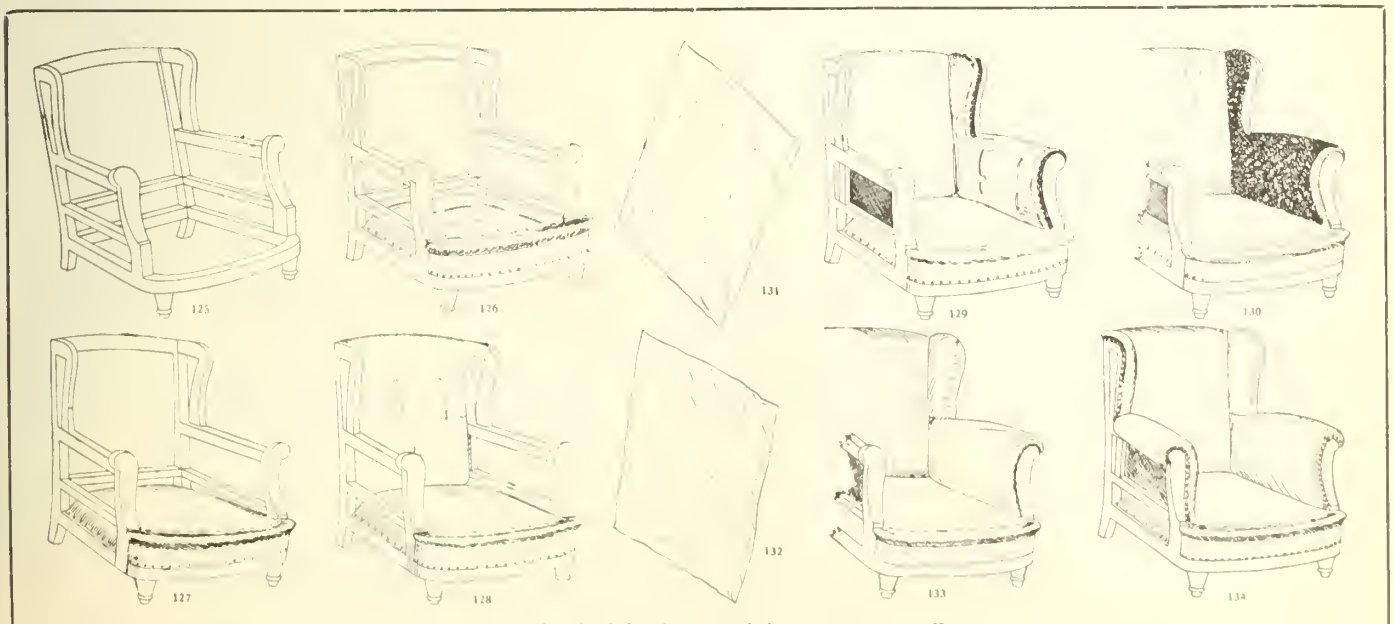
(Continued on next page)

Where Money Can Be Saved

Special Machine for Cutting Burlap Dispenses with High Priced Labor—Eliminates Waste and Increases Production

Keener competition and consequently the necessity of reduction in costs without impairing the quality of the produce, has spurred many modern manufacturers to solve and adopt improved methods in the cutting and tacking of burlap.

Formerly the upholsterer was obliged to cut the burlap for a job and also to tack it on the seat, arm, back, etc., of the furniture. This was a very expensive method and involved a waste of materials. In general, the piece worker under this system had neither the time nor inclination to make the most economical use of material. This induced a few thoughtful factory managers to start special burlap-cutting

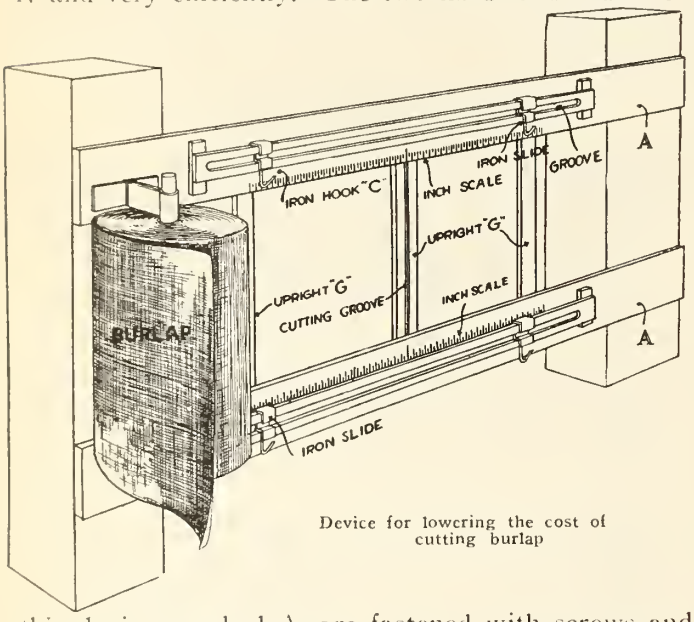


The various stages involved in the use of down as a top stuffing

and tacking departments which have proven very practical and successful. Experience proved that high priced mechanics were not needed for this work but that it could be done very satisfactorily by boys, properly trained and supervised.

The first essential for installing such a department is a competent cutter to prepare diagrams and size-cards for each style made, tacking a similar pattern where he can use waste cuts from one on another. After he has cut all pieces needed for a certain style, he lays them together in order to find the general size needed. A card index is then made showing the general size of the burlap needed on this particular pattern and also a diagram showing how the different pieces have to be cut out of this large one without waste. The actual cutting is divided into two parts. One boy cuts the larger sizes and another one lays them out and cuts each into smaller parts as per diagram.

In Figure 1 is shown a practical device which permits the cutting of large pieces of burlap very quickly and very efficiently. The two hardwood boards in



Device for lowering the cost of cutting burlap

this device, marked A, are fastened with screws and bolts upon a heavy frame. Each board is marked in such a manner that is resembles a rule showing an inch scale on each side from the centre. The sliders, marked C, are made of iron and run in a groove which makes it possible to set them at any size desired.

If a boy needs, for example, forty pieces of burlap sixty-two inches long, he fastens the burlap on the first hook towards the roll and runs the hooks to the centre of the upright G. He then moves the second hook to thirty-one inches from the centre and fastens the burlap, turning it back and refastening it again at the first hooks in the centre. He continues to move forward and backward until he has the necessary number of pieces.

The cutting can be done either by hand with a regular knife or by a special knife running the entire length of upright G. These larger sizes of burlap are given to another boy, who refers to the index cards, showing him how to cut the larger sizes into the different smaller pieces needed for the pattern. Such cutting is done by an electrically driven cutting machine which makes it possible to cut through layers of burlap ten to fifteen inches in thickness.

The saving in time and material is very considerable. This device and the standardizing of work can also be adopted successfully by the smaller factories. After the burlap has been cut, boys tack it on the frames which are received from the spring-setting department. They even upholster the front seat roll. Of course, this requires a little teaching and supervising, but it is worth while. Considering that formerly upholsterers received from $1 to $1.25 for this work, the economy is evident. It has the other advantage that every upholsterer is free to do strictly upholstering work, insuring a greater output and production at lesser cost. Twelve boys properly trained can keep about seventy upholsterers busy and amply supplied with work.

It is, or course necessary that the production manager watch this department for the first few weeks very carefully in order to insure a steady and easy flow of work. The entire furniture industry needs standardization. Frames can and should be constructed in such a way as to allow the upholstering of parts so that they can finally be assembled.—O. Rene Sulk, in the "Furniture Manufacturer and Artisan."

Application of Down as a Top Stuffing

(Concluded from previous page)

possible the full benefit of the down, when the covering is tacked into place, as shown in fig. 134.

The completed chair, should give little indication of the presence of down on the arms, wings and back, it merely carrying the appearance of a soft, comfortable, stuffed-over type.

The down pads described in connection with this chair can be used on any chair of roomy dimensions and our use of them in connection with this chair is not intended to convey the idea that this is the only style we have illustrated for which this type of down cushioning would be suitable. We have merely chosen this particular chair for the purpose of explaining the method of utilizing down pads as a top stuffing.

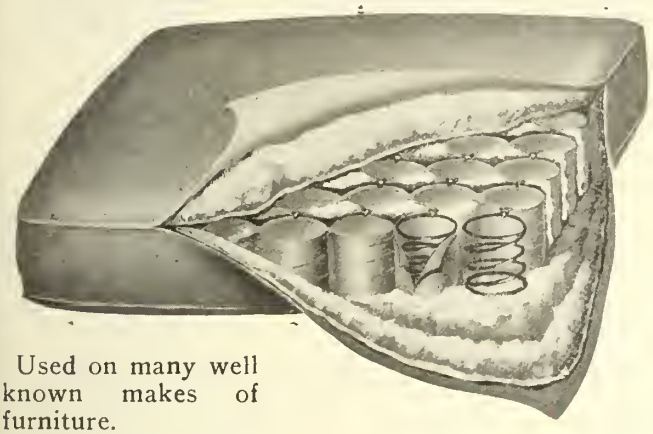
Eagle-Ottawa Leather Co.
TANNERS OF
FURNITURE LEATHER
OF EVERY DESCRIPTION
We are making a specialty of cutting
Spanish Split Leather for Chair Manufacturers
Quotations and samples furnished on application
We will be pleased to supply a very attractive sample book, of all our grades on application.
GRAND HAVEN - - - - - MICHIGAN

"COMFY" CUSHION COMPANY

Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.



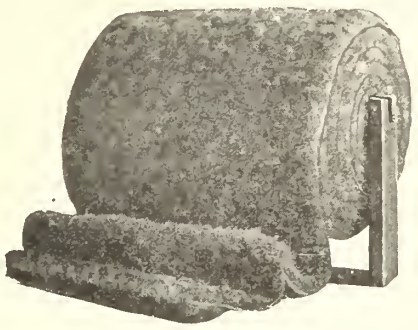
Used on many well known makes of furniture.

Write for Catalogue

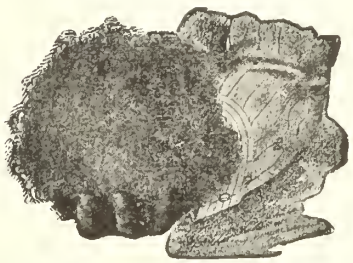
"Comfy" Cushion Co.

340 Gerrard Street, East, TORONTO, Can.

Woven Curled Hair



LOOSE-CURLED HAIR
In All Grades and Colors



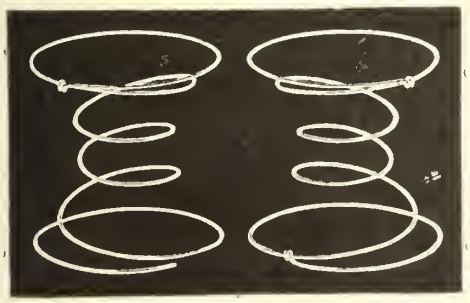
Samples Cheerfully Furnished

BLOCKSOM & COMPANY

Sterilized Curled Hair

MICHIGAN CITY, INDIANA

"IDEAL" FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,

of Canada, Limited

Windsor - Ontario

Look for Your Guarantee

PUBLISHING HOUSE of HUGH C. MACLEAN

For it's your protection against uninteresting reading.

Enquiries welcomed

Hugh C. MacLean Publications

LIMITED

345 Adelaide Street West, Toronto

DOON TWINES
MADE IN CANADA

—YOU ARE CORDIALLY INVITED—

To visit us at the Canadian National Exhibition, Booth No. 8, Manufacturers' Building.

When you have examined our exhibits, from the raw material to the finished twine, you will understand why

"DOON" TWINES STAND THE TEST

Booth No. 8 Remember!

DOON TWINES, LTD.

Mills at Doon and Kitchener

Head Office: Kitchener

MARIETTA WOOD AND METAL FINISH SPECIALISTS

Enamels for Wood and Metal Work

Our highest grade enamel for interior and exterior woodwork is "SPARTANITE."

This is unexcelled for beauty, elasticity, long-wear. Made in White and Ivory, gloss and egg-shell, or can be tinted to suit any color scheme.

But we also make special enamels for manufacturers of wood and metal products.

Put your enameling problems up to us.

The Marietta Paint and Color Co.

Marietta, Ohio

Southern Factory - High Point, N. C.

"Save the surface and you save all"—*Paint & Varnish*

D&P

QUALITY

CURLED HAIR SANDPAPER

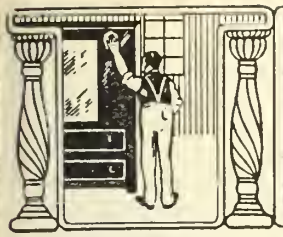
GLUE

DELANY & PETTIT LIMITED

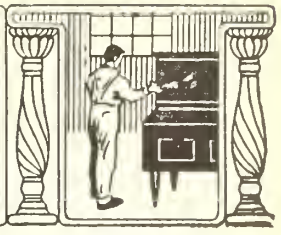
TORONTO.

OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC



THE FINISHING ROOM



Troubles With Varnish

The Difficulties an Unskilled Finisher Meets—Thinning with Turpentine Develops Defective Work

By A. Ashmun Kelly

In many instances an unskilled varnisher is unable to rub cabinet varnish after it has stood ten days to dry; it seems to be too soft. Sometimes he thins down his varnish with a little turpentine, in order to secure a harder surface for rubbing in from seven to ten days. Some of his numerous advisers (whose advice, as a rule, has been very costly and unsatisfactory) told him not to thin with turpentine, as that will injure the gloss. This is very true, though inasmuch as he wants to rub out the gloss this objection does not stand. Finally he concludes, "In order to become a good varnisher I must understand the nature of varnish troubles and how to overcome them."

There is something singular about this matter of workmen giving expert advice that does not seem just right. Either the giver does not understand the subject himself very well, or he intentionally misleads the man. I know that many experts will not impart trade secrets or routine knowledge to fellow-craftsmen. This is the result of either one or two things, viz.: they wish to have it appear that they possess superior and restricted knowledge bearing upon certain matters, or they have a jealous fear of extending competition in their line if they enlighten others who do not have the same amount of expert information. It is a pleasure to some, be it said in justice to such, to impart information.

There are two things that will usually produce a first-class varnisher, a natural aptitude for such work, and patient practice. No amount of mere telling, however correct the information imparted, will do this. The telling, if correct, has its uses, and is to be desired by the learner, but it must be coupled with practice, as stated. When this workman was told that turpentine would impair the gloss of his varnish—a fact, let us assume, he did not know before—it was very valuable advice.

More might have been said in this connection, such as the fact that where rubbing was to be done the mere loss of gloss by the addition of turpentine was not a vital matter. But that he had to thin it out showed that something was lacking in the varnish, for it should work perfectly when taken fresh from the can. Or, if thinning was necessary, owing to the varnish having lost some of its liquid contents by evaporation, thinning out was correct, but it might be that the use of benzine in place of turpentine would have answered better, for it would enable the user to readily brush out the varnish, after which the benzine would evaporate and not affect the gloss.

Thinning is not Always Effective

Sometimes turpentine is added in order to hasten the drying, and driers, too, are sometimes added for the same purpose. But turpentine does not cause the varnish to dry any quicker, though it seems to help that way. Sometimes the trouble with a varnish not spreading properly is caused by weather conditions, especially cold, when heating the varnish is much better than thinning it. This may be done by placing the can of varnish in a vessel of hot water. Varnishing done in a damp or cool room will cause troublesome spreading. Or if the room is warm and the varnish cold, the latter will work poorly. Warm both varnish and room? Yes, and the article that is to be coated should be warmed to a proper degree, say around 72-deg.

Flowing varnish is most injured by thinning, because it contains much oil. Another danger to be apprehended is that the turpentine may not be pure, but contains more or less mineral oil. We have tested samples of turpentine that showed as much as 50 per cent of such adulteration. The effect is found in the difficulty of rubbing, the varnish remaining too soft. Such varnish would not dry hard enough to rub well, and it might even remain undry and sticky. The effect of petroleum oil in paint or varnish is to impart elasticity or pliability, where that quality is somewhat lacking. But a very small portion does this. It is said that only an expert knows how to use doped goods and get away with it. I doubt his ability to do so. Doped goods are always treacherous.

Premature Rubbing

Too often varnish is rubbed prematurely; two days may be allowed for some grades, yet a day or so longer would give better results, but time is so costly now. Then varnishes differ so in drying qualities; of course, some dry much quicker than others. Some varnish will demand as much as a week, or even longer, while some other grades will dry all right in one day. New varnish does not dry nor work as well as that which has matured with age. Age improves the quality, if the air is kept away from it. To get age, the varnish, after its making, must stand in the tanks a long time, and this is expensive, as may readily be seen. The quicker the varnish is gotten into the market the better it pays the producer. However, if the quality is low to begin with, no amount of age will make it a good varnish. It is like a violin, though it is now said that age has nothing to do with improving the tone of that splendid instrument. At any rate, we know that age has a good deal to do with the quality of a good varnish.

It would be well to buy the varnish in drums and so keep it until it has sufficiently aged—provided that your capital will admit of it. By standing a long time the foots, technical for floccular matter, which comes from the seeds and plant from which the oil is pressed, settle to the bottom, leaving the clear oil above, and this may be drawn off into another and clean vessel. This clear, settled varnish will give you finer work, in that it is free from specks, and these are one of the worst troubles that any varnisher meets in applying a good gloss finish to his work.

I ought to say here, having omitted to say it in its proper connection, that if the finisher has been

nsing his varnish too heavy, that would cause poor drying, and also tempt him to thin it more. But a thin varnish does not have proper body, as a full-bodied varnish does. The thin varnish will spread out well, but will lack luster, where that is desired. If the varnish is very heavy it will likely show brush marks, especially when an inexpert workman uses it.

Use a varnish that is best adapted to the character of the work. Allow ample time for its drying. If it goes on a wood that contains considerable filler, the drying will be slower, for which allowance must be made. The better the grade of varnish used the better will be the results, providing you understand its handling. The poor varnishes give the most trouble. I have listed different sorts of troubles that the varnisher meets with during his life experiences, provided that he is unfortunate enough to come in contact with them all. Just whether all varnishers do meet with them all I cannot do more than guess, and my guess is that they do, because every varnisher works under a certain condition of things that insures trouble as well as success in his labors. All have the weather conditions, all have good and bad varnishes to handle, all have to rush things—nowadays at least.

Seedy Varnish

Several different troubles arise from doctoring a varnish, some of which have been named, but there is another called seediness; thinning the varnish will give this effect. This means the appearance of a multitude of tiny specks on the gloss finish, and which practically ruins a finish of this kind. These specks are simply very small bits of undissolved gum. Heating the varnish, instead of thinning it with turpentine, would dissolve these bits of gum. It should be remembered that varnish is made with heat, that the hard gum is melted and made fit to mix perfectly with the oil and turpentine. When the varnish is subjected to excess of cold, or where it is not sealed against the air, this gum forms these tiny atoms, and needs melting again. Thinning will not do it.

It is well for the varnisher to know how varnish is made, for this will enable him to avoid mistakes in its handling, as he too often does. The ingredients are few and simple, and the process of manufacture is not so intricate that the average mind cannot comprehend it. It is a delicate liquid, and needs to be cared for properly, as well as be applied carefully, if one is to get the best and most satisfactory results. There is not one cause of ill success with varnish that is not understood by the expert varnisher. Unfortunately, he is not always in a position to avoid more or less of the varnish troubles that come to him. For instance, his shop may not be right; there are the elements of fresh air, ventilation, proper degree of warmth, absence of excessive humidity, time allowance for work, the right varnish for the work, and many more that are only too well known and hard to command.

If the expert finds troubles, what is the man of little experience to expect? It is thought by many of the latter class that the expert never has any varnish troubles to contend with. Let him consider that as there is no royal road to learning, so also there is no easy cut to success in varnishing. Practice, practice, practice—that is the password, coupled with an eagerness to learn all possible from those willing to impart practical information who possess it. Considering that others have succeeded, there is reason to believe that you also can succeed.—Veneers, Indianapolis.

Developments in the Use of Wood Lacquer

How Should Wood Lacquer be Applied to Obtain the Best Finish?—What is the Proper Spray Equipment and How Should it be Handled?

The development of wood lacquer as a finish has brought with it, as was to be expected, certain difficulties and uncertainties which every finisher handling the material is bound to come up against. However, it is certain that wood lacquer for many purposes is an ideal and the most easily applied finishing agent, provided it is handled with a proper knowledge of the factors involved in its application. Every finisher is interested in it and for that reason two articles from a recent issue of "The Furniture Manufacturer and Artisan" are of special value. The first, by S. L. Dickenson, is as follows:

In explaining the use of wood lacquer, it may be well to start at the beginning of the use of varnish. Years ago, before the linseed oil varnish was used, furniture was finished with shellac by French polishing. Although this grade of finish went very well in European countries, for some reason or other it does not stand on this continent, therefore the oil varnish finish was superior to French polish.

When the different furniture and piano factories changed from solid wood to veneered parts, the trouble began, and even today you will find on the varnished piano that the moldings and solid wood parts stand up much better than the veneered parts do.

There are several reasons for this. In the first place, the glue under the veneer generally finds its way to the surface on the outside of the veneer. This can be determined by laying a wet piece of paper on the veneer and weighting it down over night and the paper will not come off the next morning. This glue under the veneer is affected by moisture almost as much as salt, and as oil varnish is not impervious to moisture, the moisture finds its way to the glue and immediately starts the action of shrinking and swelling. This trouble is sometimes made worse by the fact that the finisher will use a stain which contains an excess of bichromate of potash or a strong alkali. In either case, the oil in the filler and oil in the varnish will to some extent saponify in the pores of the wood; thus on the end wood streaks in mahogany you will have more trouble than on the side grain. This, no doubt, is the cause of more or less of pin holes. Someone adopted the use of shellac, a very thin coat on the stain under the filler, in order to eliminate this trouble. Although this would more or less eliminate that trouble, the acid in the shellac would in a great many cases turn the pores gray. Others put this coat of shellac on top of the filler before varnishing, but this simply would help you out of one trouble into another. If this coat of shellac was too thick, it would chip off and shorten the varnish.

Oil varnish starts to oxidize the minute it is applied and from that instant the deterioration commences and when the oil is thoroughly oxidized the life of the varnish is over.

Some years ago, the writer used to wonder why a

lead pencil was the only piece of wood glued up of two parts that would stay straight and often wondered how it was done. On finding out that this was done with a cotton solution, I immediately went to work to produce a wood lacquer to use in commercial finishing. Working on the theory that a piece of wood is absolutely permanent and if you can keep it wet all the time or dry all the time it will never rot or deteriorate in any way. The pile in the water will rot off at the water's edge, owing to the fact that it is wet and dry more times there than anywhere else. The same condition holds good on a post in the ground, as it will rot off at the surface of the ground.

Cotton being a wood fibre in the clearest form, under the microscope will resemble a glass tube. This cotton put in liquid form is nothing but a liquid wood fibre. When the solvents dry out of this liquid wood fibre there is absolutely nothing left to deteriorate as it is waterproof, will seal the pores of the wood, is more or less elastic and will not crack or scratch.

On a test by a large concern, a panel finished in wood lacquer was frozen in a solid cake of ice without cold cracking it. A piece of cross-banded stock that is thoroughly covered with lacquer (probably the best way to do this would be by dipping) can be soaked in water over night without starting the glue joint.

Spray Essential for Lacquer

Lacquer was never brushed successfully. The use of lacquer on furniture would never have developed to its present magnitude had it not been for the spray, as lacquer will dry very quickly and cannot be brushed on successfully for more than one coat. Spraying, however, has solved this problem. On the other hand, spraying, if not done properly, will not only waste material but will spoil the work and give wood lacquer a black eye. Too much care cannot be taken in the application of lacquer. Probably the best spray to apply lacquer with is what is commercially known as an outside mixer, as the air carries the fluid tip at the angle of about 90 degrees and syphons the material to the tip and then atomizes it. This type of spray is manufactured by a number of concerns and can be used at a very low pressure, therefore the atoms of lacquer do not dry before they hit the work. On an actual test, in a piano shop in New York City, the writer applied six coats of lacquer at a pressure of eighty-five pounds with an inside mixing spray and there was not enough body on this work to be rubbed. On taking a spray that mixes outside and applying six coats of lacquer at a pressure of thirty to thirty-five pounds, using a very large fluid tip, it had an excessive body on the same class of work, under the same conditions. The reason for this was that about one-third of the material went up the fan. This way it would make the cost of lacquer prohibitive. An outside mixing spray at a pressure of thirty-five pounds will use probably two cubic feet of free air per minute. The same make of spray with an inside mixing system will use six cubic feet of free air per minute, discharging at the pressure of seventy pounds; thus it not only uses more lacquer but takes more power.

A Good Finish

The following is probably the best way to obtain a good finish with wood lacquer: Stain and fill in the regular way. Apply four or five coats of wood lacquer, thinned properly, allowing about two hours between coats, and this can be rubbed twenty-four hours after the last coat, thus saving from 300 to 400 per cent of the time in your varnish room, thus cutting down the overhead and making more turnovers in a specified time. When this work is lacquered and rubbed, it can be subjected to all kinds of rough usage. It will not scratch and absolutely will not press-mark. Perfume or anything that contains grain alcohol will have no effect on it. Age does not affect lacquer the same as it does varnish.

Finish of Furniture and Similar Articles by Compressed Air

The other article referred to in the introduction discusses the use of spray machines for the application of wood lacquer. Its author, W. J. Smart, writes as follows:

The use of the spray machine or air brush for finishing furniture, cabinets, pianos and all manner of wood products is today recognized and appreciated for its merits, superiority of finish, economy in time, saving in cost of rubbing and polishing and saving of rental and floor space, for when the spray system is used the products are turned out so much faster that they may justly be considered as a rent-saving element, as well as time and labor saving.

The writer has in view a case of a recent New York City manufacturer, who was asked by a representative of one of the largest department stores how soon he could fill a good sized order for small tables. He wanted them in twenty-four hours. The manufacturer started in to state how impossible it was, when the salesman interrupted him and said, "Promise the goods, I will see that you get them out."

The tables were finished with four coats and delivered the following day. Needless to say, both the customer and the manufacturer were exceedingly pleased. Were the tables finished by the ordinary process of varnishing it would have required ten days.

The writer does not wish to state that wood lacquer will supersede varnish altogether for finishing wood products, but does consider it in order to state that the use of wood lacquers is largely increasing and that the advantages cannot be ignored by wise, progressive and up-to-date manufacturers.

Any number of coats of wood lacquer may be applied the same day, where only one coat of varnish per day can be applied.

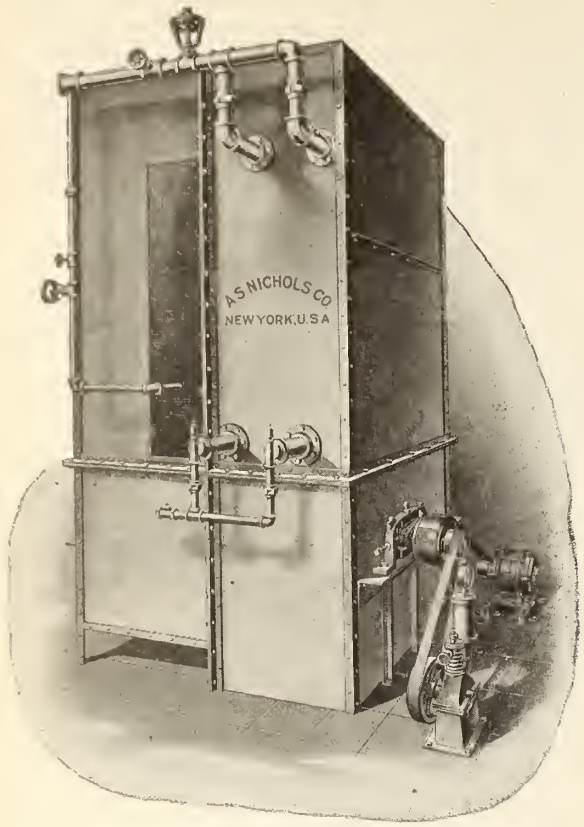
Wood lacquer is moisture proof and protects glue joints—varnish does not.

(Continued on page 91)

REEDS

We deal in all grades of Chinese, Holland and German Reeds and can ship to any destination from Toronto or New York, or direct from point of origin.
We are also dealers in Rattans, Turpentine, Cotton Linters and Cotton Waste. Prices and complete information upon request.

E. T. CARTER & CO., LIMITED
84 FRONT ST. E., TORONTO



Vertical Equipment Floor Space 4 x 6 ft.
Crated and shipped complete ready to set on the floor outside of your varnish room

Set Outside Your Varnish Room

The money a Nichols Paint and Varnish Dryer saves will pay for the equipment in one year.

This is not a wild statement but one we have proved time and again to manufacturers in practically every branch of the woodworking industry.

The Nichols Vertical Paint and Varnish Dryer is a complete unit of fan, motor, heaters, air compressor, with automatic humidity and temperature controls. A new rotary, humidifying air washer which eliminates all dust and dirt and does away with all spray heads, pump and connecting piping.

The equipment is manufactured in sizes suitable for all requirements.

Let us analyze your particular needs and quote prices on same.

A. S. NICHOLS COMPANY

Aeolian Hall

33 West 42nd St., New York City

Manufacturers of dryers for lumber, veneers, glued stock, varnish, paints, enamels, etc.

Increasing speed and reducing costs while making certain highest quality work, in your finishing room with the

DeVilbiss Spray-painting System

Whether you manufacture phonograph cabinets or chairs, metal cabinets or brass beds; whether you varnish, enamel or lacquer those products, one DeVilbiss spray operator will do 4 or 5 times as much work as a brush finisher in the same time.

On every class and grade of work the sprayed-coating will be of highest uniform quality—free from brush marks, runs, fatty edges and like faults. .... DeVilbiss exhausting equipment will insure a clean, healthful place in which to work, and reduce the fire hazard.

The outfit will be on the job every day, and cost little to operate and keep up.

These savings and advantages can be had in your finishing room, in the same profitable degree they are now enjoyed in thousands of wood and metal-working plants of every kind.

Let us mail you further particulars that meet your individual requirements

The DeVilbiss Mfg. Co.

3718 Detroit Ave. *Toledo, Ohio, U.S.A.*

Manufacturers also of DeVilbiss Spray-painting portable equipment for spray-painting factory interiors and exteriors at a big saving in time and cost.

Veneers and Panels

Conditions Affecting the Adhesive Strength of Glue

Adhesive Property is the Most Important Characteristic—The Effect of Glue Concentration, Heating and Temperature Conditions, Properties of the Wood and Condition of the Joint

By R. H. Bogue, Ph.D*

First article of a series

For all glues that are to be used for joining, panel, or other adhesive purposes, the ultimate criterion for value must, of course, be the actual adhesive strength developed and maintained in service. It would seem at a glance that the importance of this property would be so fundamental that it must inevitably constitute the principal test upon which selection would depend.

This would undoubtedly be the case were it not for the technical difficulties encountered in the making of the test. The importance of the adhesive strength has indeed always been recognized, and relative approximations of this property are constantly being made. A glue foreman will be asked to select between several glues submitted to him, and among other tests he will usually glue up a few joints of the several samples, clamp them up in the usual manner, and after standing a few hours, or a day, break them with a hammer or a chisel, and note which appears to be the strongest joint. But attempts at measuring the joint strength have not been confined to tests by the glue foreman. Many times the trained chemist has bent his energies upon the problem, but his efforts have been rewarded with only a questionable degree of success. He has, however, succeeded in demonstrating that the strength attained in any joint is dependent upon many factors. These factors have been studied, one at a time, and the effect produced upon the joint strength by varying any of them is now quite generally understood. But only by taking the utmost precaution to eliminate every variable, can truly comparative data upon strength be obtained.

Among the factors which have been found to influence the strength obtainable in a glued joint, made with any given glue, are the following:

(1) The concentration of the glue solution.

(2) The time occupied and temperature employed in heating the glue.

(3) The temperature of the glue when applied.

(4) The species, density, porosity, and moisture content of the wood used.

(5) The trueness of the joint.

(6) The amount and method of application of the glue in the joint.

(7) The temperature of the wood when glue is applied.

(8) The rapidity of handling.

(9) The pressure applied to the joint, and its uniformity of distribution.

(10) The time under pressure, and the time of curing.

(11) The temperature and humidity during curing.

(12) The method of breaking the joint.

(13) The hydrogent ion concentration of the solution.

From a survey of the above factors which may influence the joint strength of any given glue, it becomes more easily understood why the strength test has not met with greater success. A perfect control of each of the above mentioned variables is an exceedingly difficult, if not impossible, task. A brief account of the particular influence of each of these factors is given below.

(1) The Concentration of the Glue Solution.—It is self-evident that any wide variation in the concentration of the glue solution used, either above or below a definite optimum, would reveal itself by the production of weaker joints. This is, of course, recognized in a general way, but it is noteworthy that no precise determinations have ever been made, to the writer's knowledge, of the exact relationships involved, or of the exact specifications of the optimum value. In a general way it is recognized that the optimum concentration is very largely dependent upon the viscosity of the glue under consideration; that the higher the viscosity the lower may be the concentration required to produce the best results. But whether the viscosity is the only factor which defines the optimum concentration, and exactly what this concentration is for any given glue viscosity, has not been definitely established. It is common practice to use the lower grades of glues in concentration of from 35 to 50 per cent., and the higher grades at from 25 to 35 per cent. Kahrs* worked out an elaborate scheme by which the most advantageous concentration could be read off on a chart, if the viscosity (by Kahr's glue tester) was known. This was based on the principle that the viscosity was the only factor which affected the most desirable concentration. The chart merely indicated the amount of water necessary to be added to a given amount of glue of any viscosity in order to produce a batch of the specified optimum viscosity.

The writer is of the opinion, however, that such a method, although it possesses some distinct advantages, would not be equally applicable to all glues or to all woods. A fictitious viscosity is sometimes produced, which might alter the optimum value. But of more importance, a viscosity that would give the best results upon maple or other hard dense wood would probably not be so desirable upon basswood, or any other porous type. Glue joins by penetrating

*Industrial Fellow of the Mellon Institute of Industrial Research and Research Chemist for Armour & Co., Chicago.

This article represents a part of the section of the "Glue as an Adhesive" in the writer's forthcoming treatise on "The Chemistry and Technology of Gelatin and Glue," to be published by the McGraw Hill Company of New York

the pores of the wood, resulting in a muliplying of fine interlacing threads of the material extending from one to the other of the two sections of the joint. A degree of viscosity must be selected such that a fair amount of penetration may result. If the glue is too dilute, it will penetrate without any question, but the individual fibrils of glue, when dried will be too thin to impart the greatest strength. On increasing the viscosity the penetration will diminish, but the individual fibers of dried glue will be thicker and stronger, resulting in a stronger joint. If the viscosity is further increased, the penetration will have diminished until the strength obtainable again becomes small. It is on this account that glue is not a good adhesive for metal or non-porous substances. The finer the pores in a wood, the thinner also must be the glue solution in order that a fair degree of penetration may take place. Thus dense woods require a rather thin glue. More porous woods do not require such thin solutions, and if such are used the liquid will sink deep into the wood, resulting in very fine fibers of the dried glue. Consequently more viscous solutions are required for the more porous woods.

The optimum viscosity will depend also upon the use to which the glue is put. Veneer work does not require as viscous solutions as joint work. The glue must be sufficiently mobile to be easily squeezed out during the pressing, or imperfections in the smoothness of the veneer surface will result.

The Time Occupied and Temperature Employed in Heating the Glue.—One of the very common practices which results in a great lessening in the joint strength is the tendency to melt up large batches of glue, and keep in this condition at a relatively high temperature for many hours before being completely used. Often times a large amount of the glue which was melted early in the morning is still unused at night, and goes into the next day's allotment. Such a practice results in a decided weakening of the glue strength. If evaporation is prevented, either by the use of the closed glue pots, or by the addition of water to compensate for that evaporated, then the joint strength may drop as much as 50 per cent., in a day's heating.

The temperature to which the glue is heated and maintained is of equal importance. A few hours of boiling is sufficient to make a glue practically worthless as an adhesive. It is unnecessary even to heat the glue above 140 degrees Fahr., and any higher temperature will result in an unnecessary weakening in the strength of the glue.

(3) The Temperature of the Glue when Applied.—If the glue is at too low a temperature when applied to the joint it will be unnecessarily viscous, and will set too quickly. It should be sufficiently warm so that it will readily penetrate the pores of the wood, and so that it will not set before the joiner is able to finish his manipulation, and apply the pressure upon it. On the other hand, if the temperature is higher than necessary, the viscosity may have become too low; and a loss in strength will also be sustained on account of the excessive temperature, as set forth in the previous paragraph.

(4) The Species, Density, Porosity, and Moisture Content of the Wood Used.—If a given glue at a given concentration and temperature is applied to different types of wood, the strength of the joint may be expected to vary according to the particular suitability of the viscosity used to the porosity of the woods. The wood of that porosity which is most suitable for the viscosity used will show the greatest strength. Density is more or less a measure of porosity. That is, the greater the density, the less the porosity. If the moisture content is high as a result of incomplete curing, then the pores, since they already contain water, will be incapable of absorbing very much glue, and the strength must accordingly suffer.

(To be continued)

Do Furniture Makers Know How?

Faulty Veneer Work, for Which There is no Justifiable Excuse, is Prevalent, According to Retailers—Conditions Largely Remedied by Paying More Attention to Cores and Making Them up Well Before they are Needed

By S. H. Johnstone

Furniture manufacturers should find food for thought in the remark of the manager of the furniture department of one of the larger departmental stores. This was to the effect that either the furniture men of Canada did not know how to make furniture or they were taking advantage of the gullibility and ignorance of the general public for much of the furniture placed on the market was a disgrace and would not find a ready sale if the people buying furniture knew anything about it. That certainly was a strong statement and it was delivered with considerable emphasis but was not without justification. The reason in this case was some dressers which had just been placed on the floor, the tops of which resembled, I was going to say, washboards, but to say the least they were far from satisfactory.

A glance at some of the other pieces on the floor indicated that the fault was not confined to the new pieces but applied to nearly all furniture having built-up or veneered tops. There is no excuse for wavy veneered work, sunken joints or depressions of any kind. Such faults should not be permitted. If a few of the larger dealers were to adopt the policy of returning such pieces as unsatisfactory it would cause consternation in some quarters and result in a checking up of methods and more attention to results.

I don't think that any furniture manufacturer would knowingly or intentionally send out sub-standard furniture but it is a case of where the point has never been raised so that there has been no impelling reason to question either methods or results. While this may be the reason, it is not to be considered as an excuse, for every furniture maker should be proud of his product, should be willing to brand it with his name and trade mark, and should feel in honor bound to send out none but satisfactory pieces.

Why do the Faults Occur?

The faults mentioned are the result either of carelessness on the part of employees and those in authori-

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

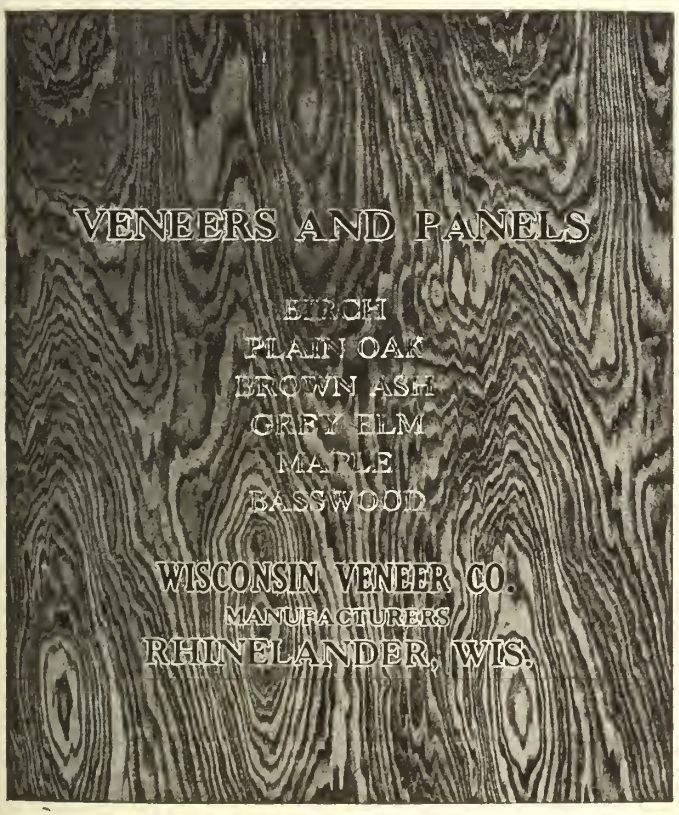
Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.



Litton Veneer Co.

Office and Mill Rockford, Illinois

Manufacturers

American Walnut Veneer and Lumber.

Plain and Figured Veneers of All Kinds.

Grand Rapids Office & Sample Room
192 Monroe Ave.
In charge of HUGH L. CURREN

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.

(When writing mention Canadian Woodworker)

ty or the result of slipshod methods. Take sunken panels, for instance. The fault should not exist. The cause and the remedy have been outlined so often that everyone having anything to do with veneers or veneered products should know all about sunken joints. Further more, the remedy is so simple and inexpensive—simply making the cores far enough ahead to permit the glue moisture around the joints to evaporate and be distributed equally throughout the whole piece before surfacing and final sanding—that there can be no reasonable excuse for permitting this trouble to continue. If every furniture manufacturer were to make a practice of jointing and gluing core stocks well in advance, say four or five weeks or a couple of months ahead, and surface and sand the cores immediately before laying, the trouble from this source would be eliminated.

High ridges and low depressions running longitudinally of the piece result from the various pieces in the core not being of the same moisture content. This causes unequal shrinking resulting in depressions where the shrinkage was greatest. Making the cores well in advance and leaving the surfacing until the last would remedy this as well as sunken joints.

There is a tendency towards built-up instead of solid cores. This is supposed to be cheaper, as well as more satisfactory than the solid construction. This idea has not come into general use and would require some careful figuring before adopting it. It has some advantages that may recommend it. With a built-up core, by that is meant one made of thin laminations, it is doubtful if sunken joints and similar defects would be in evidence. A core of this kind would have to be put through either sander or scraper before the face material is applied.

It is well to remember that the various coats of finishing material are not applied to fill up and overly perfect the surface to be finished the less it costs to finish it and the better the results. This thought come defects or faulty workmanship. The more near- is not out of place here for more attention to the core and its preparations would go a long way toward reducing finishing costs as well as resulting in furniture in which the producer would have every reason to take pride.

Simple Idea Gives Effective Results

How Output was Increased and Saving Effected in Plant Manufacturing Veneered Doors by a Slight Re-arrangement

By P. C. Bardin

It is through unusual conditions brought about by unusual circumstances that we discover our real ability, or the lack of it. The plant cannot be found where all of the mechanical detail, the layout and the personnel meet with our entire approval. We who are strangers can walk through and observe the flaws, the faulty construction, and pick out certain individuals whom we feel could be vastly improved upon.

The people who are in daily contact with a plant are the last ones to see a fault unless it is large enough to knock them over. It is also true in many cases that circumstances force a faulty condition upon us, and while we are fully aware of the condition, we are unable to eliminate the cause. It is in such cases that we are given an opportunity to use our heads. It is in such cases that the subscription price of our trade paper is returned a thousand times by perhaps one article, one idea, or one suggestion that will prove an antidote for our particular ailment—that is, if we read our paper thoroughly.

Long Pieces Caused Trouble

The writer had occasion to go into the glue room of a millwork plant manufacturing veneer doors and interior trim along special lines. Their glue room equipment consisted of two mixers, and a vegetable glue spreader, an animal glue spreader, one hydraulic press and eight large hand presses. The work was of a decidedly special nature and very high class both in workmanship and materials used. It was necessary for the equipment as well as the men to have flexibility sufficient to meet many and varied classes of work. Everything went through either the animal or vegetable glue spreaders, from the smallest panel, perhaps twelve inches long, to panels and boards sixteen to eighteen feet long.

The necessity of running this long material was the thing that threw the figurative wrench into the machinery. In order to meet this condition it was necessary to place the spreaders in such a position so that these long pieces would not feed into the wall of the building from the out-feed end of the spreader. The hydraulic press was to the right of the spreaders due to the shape and size of the room, and hence out of the straight line of production. It was impossible to use the heavy iron building trucks and rails, which in this particular case ran at right angles to the spreader, and was necessarily too far from the outfeed end of the spreader to be of any use. On small lots and extremely special work, where quantity production was out of the question, this condition did not make one's hair raise.

It was on the larger lots of door panels for wainscot and paneled interiors where the slow process made the blood boil. The material came through the spreader and the panels were built on an ordinary factory truck. When a sufficient number of panels were laid to make a press the truck was pushed alongside of the hydraulic press and bunches of two, three or four panels were placed in the press, then a caul, then another bunch of panels, and so on until the press was full.

This press loading operation required two and generally three men to handle the panels and one man to lay cauls, and it may readily be imagined the amount of time consumed, from the time the first crossbanding received the glue until the press was released. It was always necessary to do a lot of adjusting of the panels after they were in the press due to clipping in the handling. And we must not forget the danger of defective work due to the glue drying out during the extreme length of time before pressuse was applied. We must admit that, to say the least, this was a glaring fault, and yet, looking at it from their standpoint, the arrangement of the equipment could

(Continued on page 92)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.
Warren, Pa.

Plywood Dept. Warren, Pa.
Cutting Mill Salisbury Center, N.Y.

HOFFMAN BROS. CO.

ESTABLISHED 1867 INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car 1/20′	Red Oak (log run)
½	Car 1/16′	Red Oak (log run)
½	Car 1/20′	White Oak (log run)
½	Car 1/16′	White Oak (log run)
1	Car 1/28′	Walnut (half round)
25M	1/28′	Poplar Crossbanding
5	Cars 1/8′	Poplar (log run)
2	Cars 1/8′	Poplar (corestock)

Prices by wire on receipt of your inquiry

HB
Reg. U.S. Pat. Off.

FORT WAYNE, IND.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

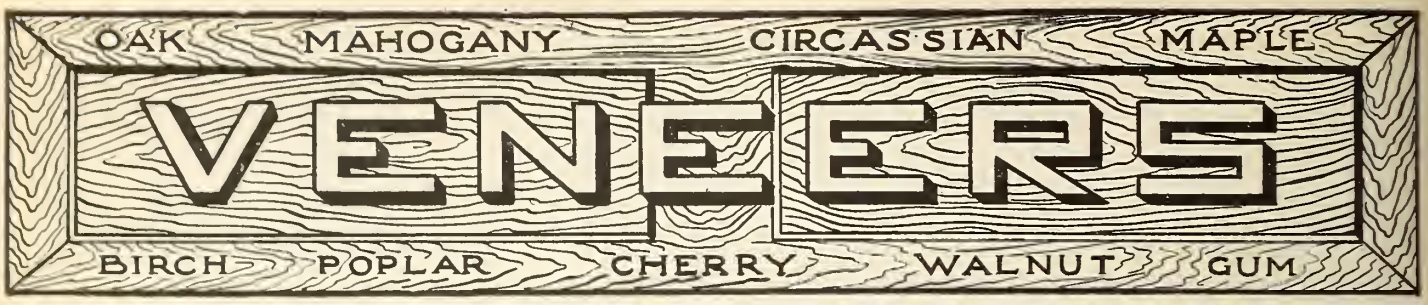
The Standard Veneer Co.
Portland, Maine

Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

May we know your requirements early?

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

VENEER MANUFACTURERS COMPANY

a veneer for every purpose **Plywood panels of all kinds**

All standard sizes and thicknesses in one warehouse

For

Fine Furniture *Musical Instruments*

Interior Finish *Door Stock*

Right Prices ***Best Service*** ***Fair Terms***

WATCH FOR OUR PRICE STOCK LISTS

1036 W. 37th. St. **Chicago, U. S. A.**

BUYERS OF VENEERS AND PANELS

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in this publication. They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend his time and money to get in touch with you. He deserves it—if his stock and prices are right.

"Established 1884"

GUELPH PATENT CASK CO. Ltd.

Scotstown, Que.

QUALITY *SERVICE*

Our Veneers and Plywood are choice and we are fully equipped to supply the Canadian Trade.

Rotary cut Textile dried

We specialize in 1/4" and 3/16" three ply Birch Panels

Ontario Representative:

Frank Moss P. O. Box 356, **Toronto**

In our New York Sample-Rooms, which are typical of the Sales-Branches. From a snap shot by R.W.W.

Quality Veneers

in

WALNUT BUTTS
MAHOGANY
LONG WALNUT
BURLS · OAK · POP-
LAR & OTHER WOODS

THE WILLIAMSON VENEER CO.

MILLS - BALTIMORE, MD.

Sales Branches: NEW YORK (709 SIXTH AVENUE) CHICAGO (28 E JACKSON BOULEVARD) HIGH POINT, N.C., JAMESTOWN, N.Y.

VIEWS OF OUR PLANT No. 11

H.G.W.L.

BLACK WALNUT LUMBER

We offer the following

Band Sawn, Uniformly Steamed

Ready for Immediate Shipment

		WALNUT		
55,000	ft.	1/2	in.	1s and 2s.
200,000	"	4/4	"	"
90,000	"	5/4	"	"
60,000	"	5/4	"	& 5 in. 1s and 2s.
100,000	"	6/4	"	1s and 2s.
115,000	"	8/4	"	"
30,000	"	10/4	"	"
15,000	"	12/4	"	"
100,000	"	4/4	"	Selects.
55,000	"	5/4	"	"
35,000	"	6/4	"	"
65,000	"	8/4	"	"
10,000	"	10/4	"	"
280,000	"	4/4	"	No. 1 Common.
90,000	"	5/4	"	"
30,000	"	6/4	"	"
265,000	"	4/4	"	No. 2 Common.
95,000	"	5/4	"	"
15,000	"	6/4	"	"
25,000	"	8/4	"	"
25,000	"	4/4	"	Clear Strips.

Unexcelled Facilities for Kiln-Drying

WOOD-MOSAIC COMPANY

INCORPORATED

LOUISVILLE, KENTUCKY

Simple Idea Gives Effective Results

(Continued from page 86)

not be changed, nor could the class of work responsible for the condition be eliminated.

Simple But Effective Solution

The problem was easily, quickly and effectually solved by removing the two sets of ball bearing rollers with their wooden base from the heavy iron truck (that is usually used on rails) and mounting it on an ordinary mill truck with the length of the rollers running across the width of the truck. This specially equipped truck could be run up to the spreader and panels built once and for good upon the rollers, with cauls laid and then pushed to the press and the entire load rolled into the press without any further delay or handling. Thus we see that through a simple yet effective idea it was possible to get quantity production, where the sizes and lots permitted, with the same equipment that handled the special work.

This same idea was introduced in an up-to-date panel plant where two vegetable glue spreaders were operated and only one press. The first spreader was installed in direct line with the press. However, when business necessitated another it was found that the only available space was out of the direct line, and this improvised truck proved a complete success when used in back of the second spreader.

It is not always the big things and the big ideas that help us to overcome difficulties, rather do we find the solution among the small and seemingly unimportant details. Those of you who know the business can realize the possible waste of time and money and the likelihood of defective work in the fore-going, as well as the subsequent saving made possible with a small idea and a few hours work on a mill truck. Did you ever hear of a simple yet effective invention that proved successful and then exclaim, "Why didn't I think of that?" Perhaps you can use this in your glue room. If not pass it on to the other fellow who needs it.—"The Furniture Manufacturer and Artisan."

A Course in Wood Gluing

Instructional work at the Forest Products Laboratory at Madison, Wis., is to be extended for the benefit of wood using industries other than those interested in kiln drying, boxing and crating. Starting September 11 a course in the gluing of wood will be be added.

The course in kiln drying has been given twenty-seven times, with a total attendance of 292; the course in boxing and crating has been given sixteen times, with an attendance of 143. Those taking the courses represented a large number of industries and came from all parts of the United States and even from foreign countries. Three short courses will be given in September on the kiln drying of wood from September 11 to September 22; on the gluing of wood from September 11 to September 16 and on boxing and crating on the same dates as gluing, September 11 to September 16.

In the gluing course, lasting through one week, the subjects covered will be as follows: Structure of various woods and how it affects gluing; prevention of shrinking, swelling, warping and cupping in boards or panels; effect of moisture in wood on glue joints; selection and use of animal glues, vegetable glues and water resistant glues; principles of laying veneer and plywood construction; control of temperature, pressure and assembly done in gluing; testing strength of glued joints; an analysis of defects common in gluing.

These courses are for industrial representatives and do not call for educational requirements. In offering them the purpose of the Forest Service is to help the various wood using industries to get better results with more of the lumber they manufacture or buy. In this way less timber will be needed and the benefits resulting from efficient production will be greater than those derived from the present wasteful methods.

Some of the firms who have sent representatives to the Forest Products Laboratory for a week or two of study have stated that they are able to effect savings and improve the quality of their goods to the value of thousands of dollars annually.

Conditions in Veneer and Panel Market

The Chicago Veneer Co., of Chicago, Ill., in its July review of the veneer market says:

"Building conditions are very strong, both for the present and for future requirements. The furniture and piano business has been light but the outlook is most encouraging. The stock of logs is short all over the country, which will prevent a surplus production of veneer. With these conditions and with money plentiful and confidence restored, we believe present conditions are more encouraging and more healthy than at any time during the past two years and we again predict a positive improvement, privided the mills do not take advantage of a heavy demand and consequent shortage to advance prices to such an extent that would cause another set-back. Even though we are in the midst of the vacation period and hot months, we are to-day experiencing a strong, healthy business."

The Veneer Manufacturers Co., of Chicago reports veneer conditions as follows:

"The veneer and panel industry has experienced a demand for its product far in excess of that for July months of previous years. This is due to the almost unprecedented building boom, which is not expected to lessen in activity for some months to come. Furniture manufacturers of all grades are experiencing a thriving business, which is also true of piano factories.

"The log shortage in the north, predicted in our market reports of February and March, has materialized. The mills are already far behind on orders and are finding it almost impossible to fill those on hand, due to the scarcity of logs.

"In the south—mills are working to full capacity and reports are that they have a fair supply of logs. Most of these mills are promising 30 to 60 days delivery.

"Manufacturers will do well to anticipate their needs and place orders before the coal and grain movements places an embargo on other commodities and thus avoid serious delays."

The first store to deliver goods to a customer's home rendered a service that the customer was quick to acknowledge. Now that every store gives free delivery of purchases, and so it is the expected thing, few customers pay the slightest attention to it—except when delivery is late.

C. L. WILLEY COMPANY

The Largest Veneer Plant *in the* World

THIS beautiful burl is a representative sample of several carloads of Walnut Burls recently cut and on hand at our plant ready for shipment.

With an organization world-wide in its operations you may rest assured that the type of figured veneer you want may be found at the Willey plant.

WHEN you are looking for veneer for a particularly fine piece of work—or when the "ordinary" kind will serve just as well—you will find the resources of the Willey plant a great convenience—a time and trouble saver.

When you want small lots of various kinds of veneer and hardwood lumber, your requirements can be completely met at our mammoth plant, and shipped in one lot, reducing the risk of loss and damage, and effecting a saving in freight charges.

When only one small item is desired, you have the entire Willey stock and equipment to draw from and your orders will always have our customary careful and prompt attention.

Some particularly beautiful, highly figured Walnut logs are just being manufactured—our stock is large and complete. Samples gladly sent to all who are interested.

Veneer & Lumber

Walnut
American and Circassian
Mahogany
Quartered Oak
English Oak
Satinwood
Vermilion
Teak
Rosewood
And Many Other Foreign and Domestic Woods

C. L. WILLEY COMPANY

2558 South Robey Street
CHICAGO

W. T. MOORE
Sales Representative for Michigan
110 Pear Street,
Grand Rapids, Mich.

W. B. VAN
Eastern Sales Rep.
Everett Hotel,
Jamestown, N.Y.

(1851)

Developments in the Use of Wood Lacquer

(Continued from page 81)

Wood lacquer will not scratch and crystallize as varnish does.

Wood lacquer resists heat that would blister any ordinary finish.

Wood lacquer will not turn white if water or other liquids are spilled on it, while varnish will.

Wood lacquer may be applied in a cold and dry atmosphere, saving the expensive installation of dry rooms and humidizing needed for varnish.

Wood lacquer will not cold-crack as varnish does.

These are a few of the good points which should be considered.

Sprayers constructed with the fluid tube inside of the air tube naturally require a higher pressure to operate than sprayers of the type in which air is discharged across the top of the fluid tube, and more rapidly syphons the material up through the container if that type of sprayer is used, and more rapidly atomizes the liquid if the overhead container or pressure supply type of sprayers are used.

A pressure not in excess of thirty-five pounds is what should be used even for a heavy wood lacquer and other materials. Some sprayers do not operate advantageously at this pressure but require a higher pressure and naturally a larger volume of air.

Since compression of air creates frictional heat, likewise expansion of air discharging through an orifice creates cold. The cold, through expansion of air, affects the finish with many solutions, and that with all solutions it causes a heavy wastage, due to the fact that with sprayers of the internal mixer type more vehicle must be used than when the type of sprayer is used which blows the air directly across the fluid tip.

This means that some sprayers are not suitable for finishing with wood lacquer, especially when using wood lacquer which must be thinned down and requires a greater number of coats, there being an undue and unnecessary amount of vehicle for the amount of actual body solution depositing and remaining on the surface of the finished article.

It would be folly to take a five-ton truck or vehicle to deliver one ton of coal, as the vehicle would depart and only leave the small amount of coal. It is just as foolish to add an undue amount of thinner to a solution, particularly wood lacquer.

The writer just received a letter from one of the lighting fixture manufacturers who was finishing his product with lacquer enamel and he complained of the work looking sandy and wanted to know the reason thereof. The answer is simple. The type of sprayer he used required high pressure and a large volume of air which semi-dried the lacquer enamel while being blown at the surface of the article and did not allow the surface to keep a saturated and wet look necessary for a smooth finish, causing a heavy wastage of vehicle and material.

Select the Right Sprayer

There are numerous sprayers on the market—presumably all of them are good for some things—to a greater or lesser extent none of them are good for all uses. The type of sprayer in which the air blows across the fluid nozzle is the most suitable for all classes of work and materials, but attention must be given to the air pressure, the volume of air and the viscosity of the solution.

One of the greatest faults which the writer has experienced among users in the past twenty-two years who have devoted themselves exclusively to this class of work, is that so many people think that because the solution must be sprayed it must be thin. The greatest drawback is to thin it. It should never be any thinner than what it would be for applying by brush, for whenever the solution is reduced that is nothing but a thinner or vehicle which conveys the body of the material to the surface to be finished, and the substance which remains after the vehicle has departed is what really gives the finished surface—the less vehicle, the less wastage.

Generally speaking, the writer would advise the use of moderately low pressure, larger air and fluid tips and a sprayer of a construction in which the air discharges below the fluid nozzles. Exception may be made for blending, shading, stenciling, etc.

Laminated Furniture Framing

There is a steadily and somewhat rapidly growing practice of making legs, posts and other framed parts of furniture out of laminated wood, where the dimensions call for something that cannot be made out of ordinary lumber stock. The high cost and the difficulties of seasoning and getting clear stock out of thick flitches has helped to increase this practice of making laminated framing parts. Another factor which has contributed to it, is the experiments of the Forest Products Laboratory which have demonstrated the qualities of laminated work and have given factory managers something official and positive to work on.

Laminated framing parts are on the whole stiffer and better from a purely mechanical standpoint than solid pieces of wood, provided, of course, that they are properly jointed and glued. About the only objection to them is that the joints show and the idea of built up work is sometimes objected to by the furniture trade on perhaps somewhat the same ground that in the earlier days they objected to veneering.

Careful matching and joining and getting similarity of texture in the wood will help to obscure the joints. And often laminated frame parts are made and pass freely as if they were solid. At other times they show very plainly. One can see in the show windows of household and office furniture stores many examples of laminated legs and posts, some made of only two pieces glued together, some three, some four and even more. And among the showings there are instances where one likes the contrasting appearance in the exposed edge of the lamination and in others it is objectionable.

On the whole, though, laminated woodwork has demonstrated its qualities and will stay with us. The final results will likely be quite a practice of building up laminated posts and frame parts, then facing them with veneer. This will furnish both the structural qualities and the face appearance and it should lead to more consistent harmony between the frame parts and the so called face parts of furnitnre.—Hardwood Record.

In most mills more oil is wasted than used. Half of this waste is caused through not scrapping old and broken oil cans. Such vessels will waste more oil in a week than would buy a new oil can.

The only prescription for sick business is the right kind of advertising.

TORONTO HARDWOOD LUMBER COMPANY LIMITED

(Formerly Lumber Dept., Toronto Veneer Co. Ltd.)

Head Office :
1100-1104 Queen St. W., TORONTO. Phone Park, 6980
Yard: Atlantic & Hanna Aves. Grand Trunk Ry. Toronto.

Montreal Office :
424 Power Bldg. Phone Main 8725
Saw-mill: Louisville, Ky.

Walnut	Gum	Birch
Mahogany	Cottonwood	Basswood
Yellow Poplar	Sycamore	Beech
White Oak	Cypress	Maple
Red Oak	Yellow Pine	Elm
Chestnut	Tennessee Red Cedar	White Ash

....Ample and well assorted stocks of above always carried in Toronto. A fair stock of kiln-dried Hardwoods carried in stock. Can make shipment at a moment's notice.

As a means of conserving your capital, why not try our mixed carload service from Louisville mill. No extra charge for including any number of items in one car. Can kiln-dry at Louisville.

We ask the privilege of figuring with you on your requirements.

OUR SPECIALTY—INDIANA FORKED-LEAF WHITE OAK.

Quality Hardwoods at Fair Prices

An unchanging high standard is your assurance of the utmost in Quality and Service when buying

PANELS LIMITED

Southampton - - - - Ontario

TOPS
CASE GOODS
FLUSH VENEER DOORS
3 AND 5 PLY PANELS
3 AND 4 PLY TABLE RIMS
5 PLY RIM BOUND TABLE TOPS

On hand for Immediate Shipment:
Stock Panels in Mahogany, Walnut, Oak, Birch, Etc.,

Sizes	24 x 60	30 x 60
	24 x 72	30 x 72

Selling Agents :

Toronto Veneer Co., Ltd. 1100-1104 Queen St. W. Toronto

The Latest in Kilns

(Continued from page 74)

larly efficient in producing circulation and may be used for various drying conditions.

When used as a type of external blower the kiln is connected with the blower and heater located just outside the kiln. Ducts to the drying room may be connected either with the suction or discharge side of the blower, thus permitting a reversal of air circulation.

By opening ventilators on the sides or the ceiling, circulation of air may be either through the pile horizontally or vertically. As in the use of the internal blower system, certain ventilators and baffles may be used for still more specialized types of circulation. If desired, the internal heating coil may also be used with the external system. In all cases, however, the various vents and baffles have been especially designed and fitted so that they do not interfere with the reproduction of the exact conditions of any particular type of kiln.

The control system, while effectual, is not unusual. With two reducing valves placed in series on the steam line, any desired pressure may be secured. Heating may be further regulated by using one or more of the four groups of heating coils in the kiln. Exact temperature and humidity control is possible through special devices with which any desired drying schedule is easily reproduced.

The entire kiln, though possible of so many variations of operation, is at any one time a simple, easily understood type. It is being put to work under a schedule that calls for a series of comparable runs, under various systems, to determine efficiency of drying as well as amount of heat required.

The Government's Conversion Scheme

The attention of the holders of the five and a half per cent. war loan bonds maturing December 1, 1922, is directed to the offer of the Minister of Finance to renew the loan on favorable terms. The last Canadian loan was placed in New York at a satisfactory price. The Minister is making his present financial operation entirely a domestic one by offering to exchange the maturing bonds for new bonds bearing the same rate of interest, running for either five years or ten years as the bondholder may prefer. A further inducement to the investor is that he receives a bonus of one month's interest. The terms offered are decidedly favorable to the investor and it is probable that a large part of the maturing bonds will be renewed. Arrangements for the exchange of the bonds can be made at any branch of the chartered banks. Holders who do not wish to reinvest will be paid in cash on the 1st December.

The Kinnon Lumber Co's Address

The Kinnon Lumber Co., Limited, wholesalers of Canadian hardwoods, are located at 454 King Street West, Toronto, and not 145 King St. West, as indicated in error in their advertisement in the July issue.

F. M. BACHMAN CO.
INDIANAPOLIS, INDIANA.
Manufacturers of
1/20 to 1" 1/8 Qt. Sawed White Oak
1/8" Plain Sawed Red Oak
1/8" Cherry
1/8" Walnut
1/28" Walnut Sliced
Oak & Walnut Veneers
Indiana Hardwoods
Parka Flooring
Established 1881

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

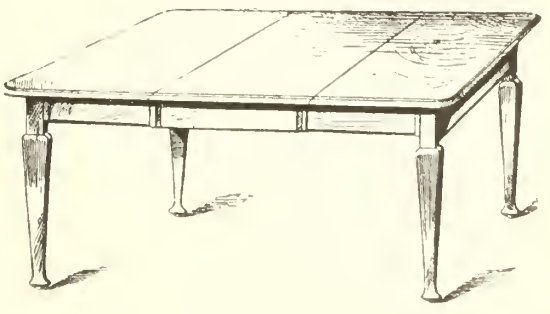
VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

GOOD Plywood is only produced by using first class materials; properly constructed, by careful and skilled workmen.

Our panels are made in this way. Panels in Maple, Birch, Plain Oak, Qrt. Oak, Walnut, Mahogany, Gum, etc., in standard sizes or made to order in quantities.

Flush Veneered Doors in B.C. Fir, Georgia Pine, Plain Oak, Qrt. Oak, etc.



Write for catalogue and prices.

HAY & CO., Limited Woodstock, Ont.

Information and Inquiries

You are cordially invited to make use of this department

Wants Veneered Slats

219 Bleury St.
Montreal, Que.

Editor "Canadian Woodworker."

Will you be good enough to advise us where we may procure a large quantity of veneered slats about 1 inch in width and in length from 4 to 10 feet? (Sample enclosed).

Yours very truly
Lavigne Window Shade Co.

The Toronto Veneer Co., 1100 Queen St. West, Toronto, are able to supply your needs and will be glad to furnish prices on application. Another firm is Robert Bury & Co., 1 Spadina Ave., Toronto. Possibly the Waterville Veneer & Panel Co., Limited, Waterville, P.Q., or any of the other firms advertising veneers in the "Canadian Woodworker" may be able to furnish the material you require.

Italian Oak Stain

11 Doulton Ave.
London, Ont.

Editor, "Canadian Woodworker."

The "Canadian Woodworker" for February contained an article by W. H. Dawson on finishing oak and using Italian oak stain. Can you inform me where I may obtain the Italian Oak Stain powder mentioned in the article?

Thanking you, I am
Yours respectfully,
A. Jenson.

If you like, you can write Mr. Dawson direct, c/o Celluloid Zapon Co., Wilmington, Deleware, with regard to the Italian Oak stain mentioned is his article. It is possible, however, that any of the manufacturers of finishing material advertising in the "Canadian Woodworker," would supply you with an Italian oak stain that would suit your requirements.

Information on Oak Flooring

Seaforth, Ont.

Editor, "Canadian Woodworker."

Could you give me the name of one or two firms who manufacture oak flooring as a specialty and could you also give me any information about laying and finishing oak flooring, or suggest a book on the subject . We should be much obliged for any information.

Yours truly,
Wm. G. L. Edmunds.

If you write the Seaman, Kent Co., Limited, Wallace Ave., Toronto, they will give you full information covering the cost of laying and the finishing of hardwood floors. We are under the impression that they issue a booklet covering the laying and finishing of such floors.

Green Cast on Mahogany

Editor, "Canadian Woodworker."

In the finishing of a number of our mahogany phonograph cabinets we have been troubled with an undesirable greenish cast. We use spraying equipment and are wondering if there is anything in the way we handle the machine that might cause this green shade. Will you kindly advise us if spraying equipment can be mishandled in this way?

Yours very truly,
P. C.

We have submitted your inquiry to the DeVilbiss Mfg. Co., Toledo, Ohio, manufacturers of spray equipment, and they reply as follows:— "There is nothing in the spraying method of application that should produce the discoloration on the work referred to in your inquiry. This kind of work is being done right along by furniture manufacturers. There are many things that might be responsible but it is difficult to tell without careful investigation of the work. Our finisher advances the suggestion, however, that the customer may be using a shellac with a rossin gum, putting some turps in it for binder which would likely cause the trouble you speak of. Then again, they may be using gasoline or a similar light solvent in their filler. This would have a tendency to produce a grey or a greenish cast.

Hardwood Handles for Can Openers

Metapedia, P. Q.

Editor, "Canadian Woodworker."

Could you give me the names and addresses of any manufacturers of hardwood handles? I require a lot of handles for can-openers, about 5 inches long and 3/4 inch in diameter.

Yours truly,
James Kenny.

The Canada Wood Specialty Co., Limited, Orillia, Ont., could take care of your requirements for hardwood handles.

Makers of Mouldings

24 Hager Ave
Toronto, Ont.

Editor, "Canadian Woodworker."

Would you please inform me of the address of a firm in the city who make cabinet makers' mouldings in oak, walnut, etc., or who make a practice of running mouldings to order.

Yours truly
Wm. Graham.

We do not know of any firm specializing in the running of detailed mouldings but believe that such firms as the Builders' Moulding Supply Co., Noble St.; George Rathbone & Co., Quebec Ave., or the R. Laidlaw Lumber Co., 2268 Dundas St. West, will be pleased to take care of your requirements in moulding.

Credits and Discounts

Three Rivers, P.Q.

Editor, "Canadian Woodworker."

The following table of discounts and equivalent interest rates appeared on page 96 of your June issue:

½% 10 days—net 30 days is equal to 9% interest per annum
1 % 10 days—net 30 days is equal to 18% interest per annum
1½% 10 days—net 30 days is equal to 27% interest per annum
2 % 10 days—net 60 days is equal to 14% interest uer annum
2 % 10 days—net 30 days is equal to 36% interest per annum
½% 10 days —net 30 days is equal to 9% interest

Will you please let me have a memo, showing how these figures are calculated.

Yours truly
N. M.

To illustrate the way in which these discounts

Uniform Lumber Means Greatest Satisfaction To The User!

You no doubt have experienced the expense, loss of time, and loss of materials, caused by the use of improperly cured, wrongly graded, and carelessly handled hardwood.

Kraetzer-Cured Lumber is absolutely uniform in quality, properly graded, and every board plainly marked, showing the grade. To show our faith in Kraetzer-Cured products, every board is stamped with our brand.

THE KRAETZER-CURED LUMBER CO.

Because of our unusual facilities we control the lumber from the virgin growth to the time it is loaded on the cars and shipped to you.

When you have once used Kraetzer-Cured Lumber you will not be satisfied with the ordinary kind. Read the eight important reasons why Kraetzer-Cured Gum is used by thousands with such satisfactory results. It will give the same results to you.

Kraetzer-Cured Lumber is of the very best quality, carefully handled by all departments. Every step in this process is taken with the idea of producing uniform high grade hardwood that w ill give maximum service in your hands.

In addition to Kraetzer-Cured Gum, we can furnish Oak, Ash and other Southern Hardwoods.

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorehead, Miss. Leflore, Miss.

You Should Use KRAETZER-CURED GUMWOOD *Because:-*

1. It is STRAIGHT and FLAT, free from the warp and twist usually encountered in untreated stock.
2. It is BRIGHT and will satisfactorily take any finish.
3. It is free from dote or rot—the sap and gums are eliminated by the steaming process, and fermentation and decomposition are thus prevented.
4. Through the elimination of stain and decomposition, it possesses greater strength and longer life.
5. It contains only atmospheric moisture, enabling it to be used for many purposes without kiln drying.
6. When kiln drying is necessary, this can be done in much less time and with more satisfactory results.
7. It is uniform and dependable. One car like another, grade and measurement what it should be—no time w a s t e d in reporting complaints or shortages, no delays or interference with factory schedules because of holding lumber for adjustments.
8. It is the most economical lumber available. It will satisfactorily answer any requirements expected of materially higher priced woods.

Join our little army of satisfied users, and just as peace is about to supplant war, let peace of mind take the place of the warfare and worries that usually beset the user of lumber.

We're proud of this product —that's why.

rates work out, we shall take the second item in the list; that is 1% 10 days; net 30 days, which is equal to 18% per annum. The manner in which this is worked out is as follows:— The bill is not due for 30 days but if you pay it in 10 days you are allowed a discount of 1% which means a 1% saving for 20 days, which is tquivalent to an 18% saving for 365 days or a year; in other words, by discounting the bill 20 days before it is due, you have saved at the rate of 18% per annum. To follow out this reasoning, take the fourth item on the list, viz., 2% in 10 days; net 60 days. In this case you save 2% in 50 days, which works out to 14% for a year.

The Lumber Market

Domestic Woods

In the hardwood lumber line business is showing some evidence of a revival, and becoming more settled. A very satisfactory trade is being looked forward to by a number of industrial concerns this fall owing to the excellent harvest at home and in Western Canada. Agricultural implement works will soon resume on a fairly large scale, furniture plants are expected to get busier and piano factories will also be sharing in the recovery. There has been quite a call for 4/4 No. 2 common and better ash for kitchen cabinets, refrigerators and other lines. The thick and better grades of birch and maple are moving a little more freely and more inquiries are beginning to come in. No. 1 common and better in birch from 6/4 up to 10/4 is selling well, while maple in 5/4 and 6/4 No. 2 common and better, is showing more evidence of life

There is no doubt, however, that any improvement has been somewhat halted during the last few days through the railway strikes, the acute coal situation and other disturbing factors.

All sales of Canadian hardwoods are made principally across the border, Canadian requisitions being limited as the majority of consumers have large stocks on hand at present and are not disposed to load up with any additional material.

Producers of Canadian hardwoods find it extremely difficult to get rid of their low ends. In some cases these connot be disposed of at a sacrifice and there is in consequence little or no profit for the operator. Speaking of this state of affairs, a leading exponent of the trade stated recently that, in the average run of logs, about 50% of the lumber was No. 2 and No. 3 common. He classified the output as follows:—

20% 1sts. and 2nds. 30% No. 1 common and better. 20% No. 2 common. 30% No. 3 common.

At to-day's prices there cannot be obtained on the average more than $8.00 for No. 3 common; $20.00 for No. 2 common; $45.00 for No. 1 common and better and $85.00 for 1sts and 2nds. This makes the average for log run about $37.00 and $38.00 and no one, who gives any consideration to the present cost of carrying lumber, will for one moment maintain that the producer can make a profit at present figures. There is too much low-grade lumber, which commands no ready market. The speaker said that it would cost, at least, $10.00 per M for sawing, piling and loading the lumber, and on top of this must come the outlay for woods operation, driving or hauling the logs, loss in transit, etc. Then to carry the stock costs, at least, 2% a month when bank interest, insurance rates and depreciation are taken in consideration.

Imported Woods

The main element affecting the hardwood market in the United States at the present time is the labor situation, the movement of lumber being restricted quite considerably and buyers holding off pending a settlement of the trouble. It is expected that when the strike situation clears up, the market will improve, although even at the present time many of the mills claim business is quite satisfactory with sales holding their own in spite of adverse conditions. In many centres inquiries for both quick and long shipments are growing, indicating that some improvement in the situation may be expected in the course of the next month or so. Prices in general are holding firm at the levels which have prevailed for several weeks, whatever fluctuations that have taken place being only minor in extent. The building situation throughout the States seems quite spirited, and to satisfy the needs of construction, much lumber is being marketed. Builders anticipate continued activity during the remainder of the season, so that lumbermen expect continued sales in this line.

Memphis, Tenn.—At this point, as in other lumber centres throughout the United States, a shortage of cars and congestion of freight incident upon the national railroad strike, is causing shipments of hardwood lumber to be withheld. It is reported that some of the mills have been forced to close down owing to lack of logs, while others are operating at only a percentage of capacity. Outgoing shipments are likewise restricted. Much concern is also felt about the lumber situation, in view of the approach of the crop-moving period which will inflict another hardship on the lumber interests. The demand for Southern hardwoods seems very good and stocks of No. 1 common and better are below normal. An increase is reported in the sale of low-grade lumber especially Nos. 2 and 3 common, with prices somewhat improved. The largest demand is from manufacturers of flooring, planing mill products, automobiles, furniture and crating.

Louisville, Ky.—The movement of logs to the mills is restricted owing to the car shortage. However, a fair demand for most woods is reported with the flooring trade and the trim producers pretty well in the lead. Building operations are very heavy. Not much buying is done on the part of the furniture trade.

Evansville, Ind.—Trade here is not expected to be like normal until the strikes are settled. Lumber manufacturers report quite a falling off in trade although orders and inquiries continue to come in. Improvement is expected by the first or middle of September. Furniture manufacturers and others engaged in the woodworking industry state that the situation depends now on a settlement of the railroad and coal strikes and that business will be satisfactory when these difficulties have been cleared up.

The cabinet maker who is very economical in the matter of clamps should not be surprised if he hears a good many complaints about his work.

TURNER-FARBER-LOVE COMPANY

MANUFACTURERS

HARDWOOD LUMBER AND SLACK COOPERAGE

SUCCESSORS TO

DARNELL-LOVE LUMBER CO LELAND, MISS.
RUSSE & BURGESS, INC. MEMPHIS, TENN.
LELAND STAVE & LUMBER CO. LELAND & CHICAGO

MEMPHIS, TENNESSEE
U.S.A.

F. T. Turner, President
G. A. Farber, Vice-Pres.
H. D. Love, Vice-Pres.
R. W. Ricketts, Vice-Pres.
F. G. Woods, Treasurer
E. C. Gause, Secretary
H. Johannsen, Ass't Sec'y.
G. W. Harris, Ass't Sec'y.
C. W. Parham, Sales Mgr.
W. F. Little, Mgr. Coop'ge

FOUR BAND MILLS
Annual Capacity 60,000,000'

CHICAGO OFFICE
1039 Marquette Building
Phone Randolph 7957

NEW ORLEANS OFFICE
629-630 Hibernia Bank Bldg.

NEW YORK OFFICE
1110 Borden Bldg.
350 Madison Ave.

We solicit your inquiries on the following Band Sawn Lumber—

QUARTERED RED GUM

60,000	5/8	FAS
30,000	3/4	"
95,000	4/4	"
80,000	5/4	"
95,000	6/4	"
100,000	8/4	"
70,000	5/8	No. 1 C&S
85,000	3/4	" "
60,000	4/4	" "
15,000	5/4	" "
85,000	6/4	" "
100,000	8/4	" "

PLAIN RED GUM

85,000	5/8	FAS
20,000	3/4	"
15,000	4/4	"
85,000	3/8	No. 1 C&S
60,000	1/2	" "
95,000	5/8	" "
100,000	3/4	" "
15,000	4/4	" "

PLAINSAP GUM

30,000	3/8	FAS
65,000	1/2	"
60,000	5/8	"
20,000	3/4	"
50,000	4/4	"
75,000	5/8	" 13/17"
65,000	4/4	" "
70,000	4/4	" 18/21"
16,000	4/4	" 9/12" Box Bbs.
75,000	4/4	" 13/17" " "
30,000	3/8	No. 1 C&S
30,000	1/2	" "
75,000	5/8	" "
15,000	3/4	" "
50,000	4/4	" "
30,000	8/4	" "
90,000	5/8	No. 2 Com.
95,000	3/4	" "
60,000	4/4	" "
60,000	8/4	" "

QUARTERED WHITE OAK

100,000	3/8	FAS
60,000	1/2	"
20,000	5/8	"
85,000	3/4	"
30,000	3/8	No. 1 C&S
80,000	1/2	" "
95,000	5/8	" "
90,000	3/4	" "
90,000	4/4	" Strips
60,000	5/8	No. 2 Com.
85,000	3/4	" "

PLAIN WHITE OAK

30,000	3/8	FAS
50,000	5/8	"
40,000	1/4	No. 1 C&S
35,000	3/8	" "
60,000	1/2	" "
50,000	5/8	" "
25,000	3/4	" "
20,000	4/4	" "
75,000	1/2	No. 2 Com.
50,000	3/4	" "
15,000	4/4	" "

PLAIN RED OAK

35,000	3/8	FAS
70,000	1/2	"
80,000	5/8	"
30,000	3/4	"
15,000	4/4	"
20,000	1/2	No. 1 C&S
90,000	5/8	" "
85,000	3/4	" "
30,000	4/4	" "
6,000	5/4	" "
4,000	8/4	" "
100,000	3/4	No. 2 Com.
100,000	1/2	" "
70,000	5/8	" "
100,000	3/4	" "

QUARTERED RED GUM
(Sap no Defect)
KRAETZER-CURED

60,000	5/8	FAS
2,000	3/4	"
30,000	4/4	"
50,000	5/4	"
30,000	6/4	"
75,000	8/4	"
20,000	5/8	No. 1 C&S
5,000	3/4	" "
70,000	4/4	" "
25,000	5/4	" "
30,000	6/4	" "

QUARTERED RED GUM S N D.

100,000	5/8	FAS
95,000	3/4	"
75,000	4/4	"
80,000	5/4	"
35,000	6/4	"
30,000	8/4	"
30,000	10/4	"
25,000	5/8	No. 1 C&S
75,000	3/4	" "
90,000	4/4	" "
80,000	6/4	" "
90,000	8/4	" "

ELM

10,000	4/4	Log Run
4,000	4/4	No. 1 Com.
10,000	4/4	No. 2 Com
15,000	8/4	" "
25,000	10/4	" "
18,000	12/4	" "
25,000	5/8	No. 3 Com
15,000	8/4	" "
11,000	12/4	" "

ASH

80,000	1/2	FAS
15,000	4/4	"
16,000	12/4	"
15,000	4/4	No. 1 C&S
12,000	8/4	" "
12,000	12/4	" "
12,000	4/4	No. 2 Com
3,500	12/4	" "
10,000	4/4	No. 3 Com

PANTHERBURN CYPRESS

20,000	4/4	FAS 4 to 12"
75,000	5/4	" 4 to 12"
40,000	6/4	" "
20,000	8/4	" "
4,000	10/4	" "
30,000	12/4	" "
80,000	4/4	" 13/17
100,000	5/4	" "
15,000	4/4	" 18/up
50,000	5/4	" "
60,000	4/4	Selects
95,000	5/4	"
70,000	6/4	"
60,000	8/4	"
9,000	10/4	"
12,000	12/4	"
30,000	4/4	Shop
15,000	5/4	"
15,000	6/4	"
30,000	5/4	No. 1 Com
50,000	4/4	No. 2 Com Resawn
100,000	4/4	" " "
15,000	5/4	" " "
25,000	6/4	" " "
12,000	8/4	" " "
150,000	4/4	Boxing
30,000	5/4	"
60,000	6/4	"
150,000	4/4	Pecky
45,000	4/4	x 18 Pecky

MISCELLANEOUS

15,000	4/4	FAS Cottonwood 6/up
50,000	4/4	" " " 13/17
25,000	4/4	No. 1 Com Cottonwood
3,000	5/4	Log Run Hickory
75,000	8/4	Log Run Hickory
15,000	6/4	No. 1 Com Hickory
20,000	4/4	No. 2 C&B Black Gum
30,000	4/4	No. 2 C&B Qt. Black Gum
12,000	4/4	No. 2 A&B Com Poplar

CYPRESS LATH

7,000	3/8 x 1½—32" No. 1
100,000	3/8 x 1½—48" No. 1

CYPRESS SHINGLES

50,000	4"	Best
250,000	5"	"
175,000	6"	"
150,000	4"	Prime
250,000	5"	"
125,000	6"	"
250,000	4"	Economy
350,000	5"	"
200,000	6"	"

We can kiln dry and surface and ship straight and mixed cars.

Sole Manufacturers PANTHER BURN Cypress

News of the Trade

Manual training equipment will shortly be installed in the Oakville, Ont., high school. ,

Fire caused $1,000 damage recently to Mr. Sargent's planing mill on King St., London, Ont.

The Globe Furniture Co., Waterloo, Ont., is erecting an addition to its factory, at a cost of $15,000.

Linde Canadian Refrigerator Co., Lachine, Que., are building a new factory at a cost of $40,000.

Mr. Nathan Calder is building a planing mill on Inkerman St., Listowel, Ont., and is interested in the prices of equipment.

Announcement was made recently by Robert Gray that Gray-Dort Motors, Ltd., will erect a large plant at Windsor, Ont.

The lumber mill of Albert Parsons, Walton, Hants County, N. S., was completely destroyed by fire with a loss of about $10,000.

The millwork contract on the new Catholic school at Bordeaux, P. Q., was recently awarded to Mr. George Lebel, 201 Baby St., Montreal.

William Luck, Holland Landing, Ont., for many years engaged in the carriage making business, passed away recently in his 89th year.

Purdy Radio Phonograph Co. Ltd., Toronto, was recently incorporated to manufacture and deal in radio and phonograph equipment. Capital $40,000.

The Gotfredson Joyce Corporation, Ltd., Walkerville, Ont., truck manufacturers, have awarded a contract for an addition to their factory to cost $40,000.

The Whistle Bottling Company of Hamilton, Ltd., Hamilton Ont., has been incorporated to manufacture and sell all kinds of containers including wooden boxes.

R. Truax & Co., Walkerton, Ont., are excavating for the construction of a dam to furnish power for their sash and door factory on the Saugeen River.

The Canadian Top & Body Co., Tilbury, Ont., held a picnic at Seacliff Park, Leamington, Ont., recently, when seven hundred people enjoyed the day.

Drapery Trimmings, Limited, Toronto, were recently granted a provincial charter to manufacture and market upholstery trimmings, braids, laces, tassels, etc. Capital $50,000.

The Hayes Wheel Company of Canada, Ltd, Chatham, Ont., have been granted a federal charter to manufacture carriages, wagons, automobile bodies, trucks and all kinds of wooden wheels, with a capital of $1,800,000.

Shea's Hippodrome, Toronto, will shortly install a $40,000 pipe organ. When the Hippodrome was opened in 1913, an orchestral organ was purchased in Germany, but the instrument proved too mechanical and was abandoned.

Jean L. Auger, St. Mathieu, Que., is putting in the foundations for his new planing mill. The building when completed will be a one and a half storey structure and will cost about $6,000.

Dodge Bros., automobile manufacturers of Detroit, Mich., have purchased a factory site in Windsor, Ont., and will erect a large plant there to look after Canadian and possibly their export trade.

The Queen City Furniture Co., Toronto, recently added 4,000 square feet to their factory, giving them a total of 46,000 sq. ft. The company also found it necessary to double their staff.

S. C. Johnson & Son Company, varnish manufacturers of Brantford, Ont., announce they will build an addition to their plant at a cost of $125,000. If the plans materialize, Brantford will have one of the largest manufacturing plants of this kind in Canada.

Messrs. A. E. Smith & Son, of Cataraqui, Ont., recently opened a woodworking plant and are manufacturing ironing tables, clothes racks, medicine chests and cabinet work of every description. The company hopes to extend their premises and install additional machinery in the near future.

Messrs. J. P. Abel Fortin & Co., 383 Desjardins St., Montreal, were recently awarded the contract for millwork on the new Stadacona School, for the Catholic School Commission, being erected on Stadacona street, between Darling and Davidson streets.

Damage estimated at $25,000 was caused by fire recently at the plant of Messrs. Germaine Lepine Co., undertakers and coffin manufacturers, St. Valier St., Quebec. Thirty thousand feet of fine boards were destroyed, along with several vehicles which were in storage.

A. Chown & Co. Ltd., Kingston, Ont., have been incorporated to take over the business of A. Chown & Company, and to manufacture and deal in heavy hardware for carriages, automobiles, boats, etc. Capital $200,000. A. F. Chown and P. B. Chown are two of the incorporators.

The millwork contract on the new school at Mountain & Parr streets, Winnipeg, Man., is held by Messrs. Brown & Rutherford and Messrs. Sutherland & Buchanan. These two firms also share the millwork contract on the new school at Grosvenor Ave. and Wilton St., in that city.

The British & Colonial Furniture Co., Ltd., Toronto, have been granted a provincial charter to manufacture and deal in furniture and fixtures, provided they do not use more than $100,000 capital in Ontario. Colin J. Lappin, of Toronto, is manager of the new company.

Joseph Landreville & Sons, Ltd., Toronto, Ont., were recently granted a provincial charter to manufacture and market all kinds of cooperage stock. Capital $100,000. J. D. Landreville and J. C. Landreville, both of Toronto, are two of the incorporators.

The "1900" Washer Company, Binghampton, N. Y., makers of washing machines, are negotiating with Beatty Bros., of Toronto, to sell their Toronto branch, which is largely an assembling plant. Beatty Bros. will, if the plans carry, erect their own production plant and employ a large sales staff.

Wm. Black, of the Yorkton Planing Mill, (Logan & Black), Yorkton, Sask., died recently in the local hospital, following an operation for appendicitis. Mr Black was well known throughout the district having been connected with the above firm for a period of 17 years.

The Sault Lumber & Mill Co., Sault Ste. Marie, Ont., was recently granted a charter, with a capital of $125,000. and is the successor to the Corrigan Lumber & Mill Co. F. E. Hollingsworth is president and manager of the new company.

The Sterling Woodworking Company were recently awarded the millwork contract for the new Medical Arts building, at the corner of Guy and Sherbrooke Streets, Montreal. Their address is care of the architects, Messrs. Ross & MacDonald, 1 Belmont St., Montreal.

The late Dr. Alexander Graham Bell, the inventor of the telephone who passed away at his estate Beinn Bhreagh, near Baddeck, N. S., recently, was a builder of high class boats. During the war Dr. Bell did useful work in building small craft for the Canadian and British governments. It was the first boat building establishment to employ women.

Mr. Alfred J. Paro, Trenton, Ont., recently constructed a fine sash and door factory in that town. The factory is equipped with modern machinery for the manufacture of sash, doors, frames, trim turning and cabinet work of all

QUALITY SERVICE

In Canadian Hardwoods

K ind you want

I mpressive quality

N o better manufactured

N o kick

O n grades

N ow is the time to order a sample car

THE

Kinnon Lumber Co.

LIMITED

454 King St. W. Toronto

New and Used Woodworking Machinery

We Can Save You Money—Look over our partial list and if you do not see your requirements—Write, wire or phone us.

Shaving Exhausters	
50" American Blower Co., 16" Outlet	$ 75.00
48" Foster Ball Bearing 18" Outlet	100.00
36" American Blower Co.	65.00
Moulders	
7" 4 Sided Goldie McCullough	350.00
7" 3 Sided Cowan & Co.	275.00
12" 4 Sided Cowan & Co.	650.00
Shapers	
2 Spindle	100.00
1 Spindle	85.00
Sanders	
Pattern Makers 18" Disc and Drum	75.00
No. 131 Mattison Belt, 8' Table	350.00
Planers	
20" Major Harper Poney Planer	250.00
24" Major Harper Poney Planer	175.00
30" x 12" McGregor Gourlay Double Surfacer	1250.00
McGregor Gourlay Universal Woodworker	200.00
24" Buzz Planer (No Fence)	100.00
Mortisers	
McGregor Gourlay	100.00
Lathes	
12" Pattern Makers Iron Bed	75.00
Saws	
Trim and Rip Saw	125.00
42" Jackson Cochrane Band Rip	250.00
Elliot Woodworker 1 H.P. Motor	180.00

GENERAL MACHINERY Company

67-69 Frederick St., TORONTO

TELEPHONE MAIN 2200

The Peter Hay Knife Co., Ltd.

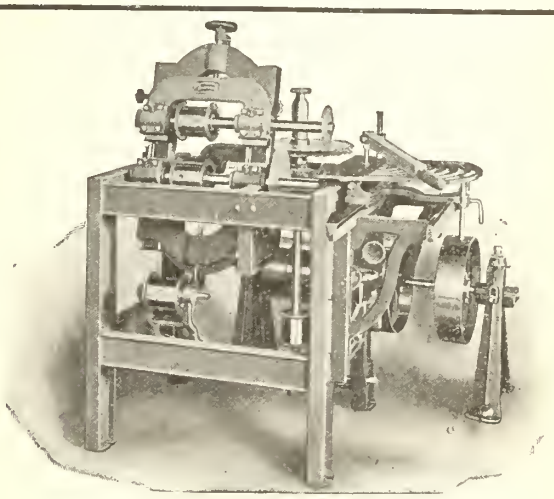
Manufacture the Best

PLANER KNIVES and CUTTERS

OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited

GALT, ONTARIO



No. 19 Saw Tenoner

Fitted with five saws, has replaced cutter head machines; for all jointing and halving in wood shops and for automobile and carriage wood-work it is the best machine on the market.

Much door, window, sash, furniture and cabinet work is done with this machine where a nice, smooth tenon is required. It is also used for the halving and jointing of stock at any angle.

Tenoners equipped with flexible coupling for direct motor drive or for countershaft.

No. 19 Small Saw Tenoner.
No. 20 Large Saw Tenoner.
No. 21 Regular Bevel Saw.
No. 22 Large Bevel Saw.
No. 23 8½ Irregular Dresser.
No. 24 6" Irregular Dresser.

Write for catalogue.

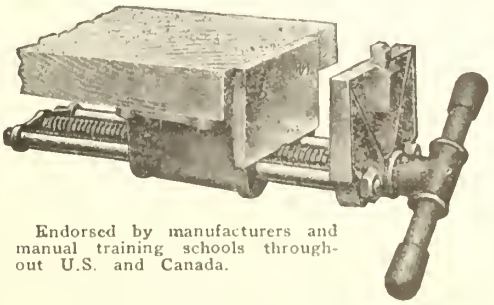
Pettingell Machine Co.

Amesbury, Mass.

Mention Canadian Woodworker

We also manufacture metal working machines.

Quick as a Cat - A Hold like a Bull Dog



Endorsed by manufacturers and manual training schools throughout U.S. and Canada.

No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

No. 430 Vise—Two Sizes with or without stop

UNEQUALLED FOR STRENGTH AND DURABILITY

Our Complete Catalogue on Request

RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT

kinds. Although the factory has been under way but a short time, Mr. Paro reports plenty of business on hand.

The Art Craft Furniture Co., Goderich, Ont., a new concern recently organized, has been granted exemption from taxation except school and business tax, for a term of years. The ratepayers also authorized the sale of the factory formerly owned by the Wheelrigs to the new furniture company for $9,700, the amount owing by the former company.

Dauncey & Nelson, Brighton, Ont., sash and door and interior trim manufacturers, recently dissolved partnership, the interest of the latter partner being purchased by J. Carther. The firm is now known as Dauncey & Carther Lumber Co. Business is reported by them to be very satisfactory this season.

The question of most vital interest, however, is whether or not the period of greatest stress is behind us. A decreasing total of failures in the United States duirng the successive months of the present year would seem to indicate a definite improvement in conditions. Canadian figures disclose a similar situation, in spite of the extremely high business mortality rate during the first half of the year. The record of solvency during the second quarter is an improvement over that of the first quarter.—Royal Bank of Canada.

The sash and door plant of S. L. Lambert, Welland, Ont., was totally destroyed by fire lately, entailing a loss of $30,000. The building destroyed was a structure, 30 x 110 ft., with some of the machinery still in the process of installation, including a $4,000 piece of equipment which had worked but three loads of lumber. The insurance is about one-third of the total loss.

The Clatworthy Lumber Co., Limited, with head office in London, Ont., and a capital stock of $40,000., has been granted a provincial charter, to carry on a business dealing in wood and coal, as well as timber merchants, sawmill and planing mill operators, etc. The incorporators are A. J. Clatworthy, of Granton, Ont., and T. A. Clatworthy and M. F. Clatworthy, of London.

Mr. R. H. Tye recently purchased the interest of J. C. Scripture, of Colborne, Ont., in a fine planing mill and lumber business in that town. The planing mill is equipped with modern machinery throughout and has an excellent location. There is a saw mill at the rear of the planing mill and the yard is well stocked with lumber. Business is reported very good.

Mr. F. A. Hubbs, of Picton, Ont., a well known figure in the woodworking trade throughout, Ontario, recently opened a sash and door factory in the above town. Mr. Hubbs was for several years connected with A. H. Brown in the woodworking business, later head of the firm of Hubbs & Allen, manufacturing sash and doors, and was foreman of the sash and door factory of Hayatt & Hart until this company was burnt out.

The Bell Furniture Co., Limited, of Southampton, Ont., are adding four more Class D, Sidman lumber curing kilns in concrete buildings to their battery of kilns. They are also completing their storage sheds, transfer and kiln car yard system, and when completed all their lumber will be piled direct from the railroad cars onto kiln cars, the lumber being handled only once from the railroad cars to cut-up saws.

The plant of the Dominion Furniture Company, Edmonton, Alta., was completely destroyed by fire recently. The loss is estimated at about $40,000, not a piece of furniture or machinery being saved. The company was organized a little over a year ago and their product, manufactured from native woods and treated with a curing process, was finding a ready market in Western Canada. R. H. Douglas is the present manager of the company.

The Art Craft Furniture Company, Goderich, is a new firm recently organized. H. N. Ubelacker, of Stratford, is the managing director and R. P. Gough, president of Sellers-Gough, and Hon. T. W. McGarry, formerly provincial treasurer of the province of Ontario, are included in the directors. The new company will be established in the large plant formerly occupied by the Goderich Merchantile Co., with the city of Stratford in view for future developments. Between 55 and 60 hands will be employed at the outset.

The Satin Finish Hardwood Flooring Co. Limited, has been granted a charter and has installed a plant in the former K. & S. tire factory in Weston, Ont. The authorized capital of the company is $100,000. and the organization is empowered to carry on the business of manufacturing and dealing in hardwood flooring, sash, doors, woodenware, etc. Among those associated with the enterprise are W. C. Gardiner, late of the Builders' Moulding Co., and W. T. Cole, late of the Seaman, Kent Co., Toronto.

Obituary

William Simpson, who for many years was at the head of the William Simpson Planing Mill, Queen St. West, Toronto, died recently at his home. He had resided in Toronto for 45 years, but retired from business in 1905. Mr. Simpson was born in Keith, Scotland, 80 years ago and came to Canada when a young man, entering the lumber line. He is survived by his widow, four sons and four daughters.

Harry K. Bowes, M.A., managing director of the Office Furniture & Supplies Company, Brockville, Ont., died at his residence in that city recently after an illness of some duration. Deceased was 39 years of age, a native of Sackville, N. B., and a former resident of Ottawa. Deceased was a member of the local Board of Education and president of the Young Libera Club.

Face to Face With Prosperity

Winnipeg, August 8.—Grain companies, mills, railroads and the Lake Shippers' Association are just now feverishly preparing to handle what is expected to be the largest grain yield in the history of the Canadian Northwest. Rolling stock is being borrowed from eastern divisions and the banks are accumulating surpluses of cash at small branches from the lakes to the mountains in preparation for the big movement.

Official statistics from the grain exchange show the wheat acreage of the three provinces to be 21,146,000. In 1915 the acreage was 13,867,715. The average yield per acre then was 25.97 producing a yield of 360,187,000 bushels. The most optimistic, however, does not anticipate a yield so high this year. For ten years, however, the average has been 17 bushels. Upon this basis the yield this year would be 359,822,000 and this is the minimum that well informed sources expect will be produced.

The question on October wheat, say July 10, 1915, $1.03⅜. July 10 this year October wheat quotation was $1.16¼. On the basis of this quotation this year's crop ought to yield at Ft. William, $417,393,520 or in cash, $47,250,000 more than the famous 1915 crop. The amount that would reach the farmers' hands would be, in cash, $327,438,000 because it costs 18 cents freight and six cents elevator charges per bushel to handle to head of the lakes. Approximately this amount of cash will be released through ordinary business channels in the west this fall.

Of course this is a debt-paying crop, but if conditions today continue it means that the books will be cleaned and all paper liquidated.

The Sidman Lumber Curing Process

IN

Remodeled or new, Wood, Brick or **Concrete** Buildings.

Fillers and glazes to preserve the building.

The TAG-ROESCH **Automatic** Time-Temperature and **Humidity Controller.**

Three-ply and Du-o-fold Army Duck Curtains, and Hussey Door Carrier Doors.

Automatic Heating, Ventilating and Humidity Systems for Varnish Rooms.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Sidmans AUTOMATIC **Suction System** for returning ALL Condensation DIRECT to the Boiler.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-Down Draught Vent Heads for all purposes.

Cleanable Screen Panel and Window Ventilators.

Roller Bearing (Ott) **Channel Iron** Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and The Sidman Special Hygrometers.

For Description and prices, write

The

Sidmans of Canada

Heating and Ventilating Engineers and Lumber Curing Specialists

LONDON ONTARIO

Bone Dry

Canadian Hardwoods

offered for quick sale

2	cars	4/4″ No. 1 C&B Basswood.
3	“	5/4″ No. 2 C&B Basswood.
1	“	8/4″ No. 2 C&B Hard Maple.
2	“	12/4″ No. 1 C&B Hard Maple.
4	“	4/4″ No. 1 C&B Birch.
2	“	8/4″ No. 1 C&B Birch.
2	“	12/4″ No. 1 C&B Birch.
2	“	8/4″ No. 2 C&B Oak.

Stock that will please the hard to please

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 514 Canada Cement Co., Bldg.

Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

USED MACHINERY

For Quick Sale

1—30" Double Surfacer.
1—26" Double Surfacer.
1—24" Double Surfacer.

Above machines equipped with two-knife square cylinders, sectional rolls, flexible chip breakers, countershafts.

Special price for quick sale.

Colladay Machine Works, Manufacturers of Woodworking Machinery, 626 Race St., Philadelphia, Pa. T.f.

Machinery for Sale

One single Tenoning Machine
One Two Spindle Shaper
One Single Spindle Ro ting and Dovetailing
One Universal Sander
One Surface Oak Printing Machine
One Sawmill Carriage and Saw Frame in good condition.
One Electric Motor—35 Horse Power This has only been run one month.
One Electric Motor—50Horse Power This has only been run one month.

All the above are second hand—and as good as new. Ask for particulars. National Table Co. Limited, Owen Sound, Ontario. 6-8

POSITION VACANT

Wanted in a progressive Canadian town within 100 miles of Toronto, Ontario, a competent experienced detailer and biller for large millwork factory. Young man preferred with proper qualifications. Answer by letter in own handwriting. State whether single or married and salary expected with all necessary references as to character and ability. Position permanent and working conditions exceptionally good. Address Box 140 Canadian Woodworker, Toronto. 8-9

WANTED

A good handy sticker hand must be able to make his own set ups. Steady job. State wages expected. Apply HILL CLARK FRANCIS Limited, New Liskeard, Ont. 8

WOOD TURNINGS

General wood turnings done by experienced men, also novelty turnings. Apply E. Kobe, Box 257, Hanover, Ont. 8

GOOD VALUES

Subject to Prior Sale

Band Resaw, Connell & Dengler, 54 and 60 inch.
Band Rip Saw, Yates No. 281.
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 30" and 44".
Dowel Machine, Clement.
Dowell Gluer and Driver, E. B. Hayes.
Jointer, Falls Machine Co., undercut 24".
Jointers, 12", 16", 24".
Jointer, Diehl Continuous Feed.
Lathe, Back Knife Clement 40 in.
Matcher, American No. 229 hardwood.
Moulder, Hermance 8 and 10 in. 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 7" and 10" 4 side.
Planers, all sizes, single and double.
Sander, endless bed, 48 in. H. B. Smith.
Sander, Moore Machine Co., belt.
Sanders, Berlin 36", 42", 48" and 60".
Sander, Clement Belt roller table.
Saw, mitre double end Maddox.

Woodworking Machinery Co., of Buffalo,
54 Mechanic St.,
Buffalo, N.Y.
7 T.f.

FOR SALE

19 H.P. Gasoline Engine, 25 H.P. Wheelock Steam Engine, Steam Chair Back Bender, 2 Spindle Borer Machine, 2 Veneer Presses, 1 Glue Spreader, Double Belt Sander, Cabinet Benches, Surface Planer, Glue Pots, 5 Ton Wagon Scale, 2 Wood Presses, 150 H.P. Boiler, 1 Sheldon Dry Kiln, Factory Trucks.

Manufacturer of Doors and Window Frames, and Dealer in Lumber, Coal, etc.

R. W. NICHOLSON,
8-T.f. Strathroy, Ont.

WANTED

A competent factory superintendent for Planing Mill connected with a Retail Lumber Yard in Western Ontario. One capable of getting out drawings and taking off bills of material necessary, and thoroughly experienced in the handling of men. State age, experience, salary and references. Box 139 Canadian Woodworker, Toronto. 8

Grant Permit to Develop Power at Kettle Falls on Columbia

The U. S. Federal Power Commission has authorized the issuance of a preliminary permit for three years to the Washington Water Power Co. for a power project at Kettle Falls on the Columbia River. The ultimate installation is estimated at 153,400 h.p. The company proposes to develop the project in three stages correspondingly as a market for the power can be found. In the initial development it is proposed to use the natural fall of about 30 ft. at Kettle Falls. As the demand for power increases, additional capacity will be provided by building a 60-ft. dam across the Columbia River. The height of the dam may later be raised to 75 ft. by the use of gates. Provision is made in the permit for the conveyance to the United States of such lands and rights-of-way as may be required for navigation facilities built by the United States.

Under a treaty With Great Britain made in 1846, the Columbia River is to be kept open for navigation by British subjects trading with the Hudson Bay Co. The permit provides that project works shall be designed to keep existing portages free and open.

Belgian Production of Iron and Steel in May

Figures of Belgium's iron and steel output for May show pig-iron production to have regained the March level after a sharp decline in April, reaching 118,940 tons. Raw steel, with a May production figure of 112,610 tons, also shows a marked improvement over preceding months, being 186 per cent. of the average monthly output during 1921.

Owing mainly to French competition, rough steel castings declined to 5,690 tons, this figure being lower than for either of the months immediately preceding. Finished steels, however, advanced to 102,030 tons in May, an increase of 10 per cent. over April. The finished-iron output amounted to 12,320 tons, an advance of 75 per cent. over the April figures.

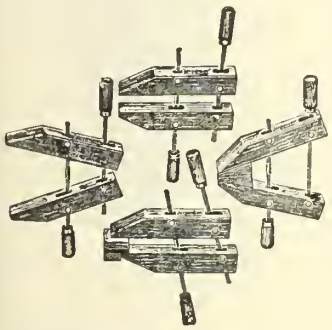
Smelter production for May was 8,830 tons, slightly superior to April but not attaining the maximum reached in March.

Allotments for Tokyo Improvements

A special committee has studied the allotment funds for the improvement of the streets and canals in Tokyo at the request of the Home Minister. They came to the conclusion that a total sum of $54,500,000 should be allotted for these purposes and spread the work over seven years. Of this amount there is allotted for street improvement 10 per cent. of the total during 1922, 15 per cent. in 1923, 15 per cent. in 1924, 16 per cent. in 1925, 18 per cent. in 1926, 17 per cent. in 1927, and 9 per cent. in 1928; while for canal improvements 20 per cent. of the total is allotted for 1922, 21 per cent. for 1923, 17 per cent. for 1924, 17 per cent. for 1925 6 per cen. for 1926, 13 per cent. for 1927, and 6 per cent. for 1928. It would appear that this program would justify the employment of important amounts of construction machinery.

"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.



"Jorgensen"

Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

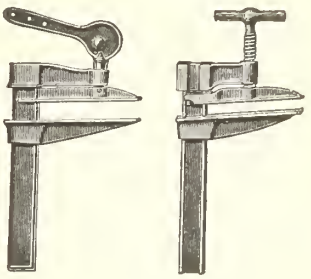
For Sale By

Aikenhead Hardware Limited .....Toronto
Caverhill Learmont Co. .....Montreal
Lewis Bros., Limited .....Montreal

Colt's Clamps

for the

Woodworker



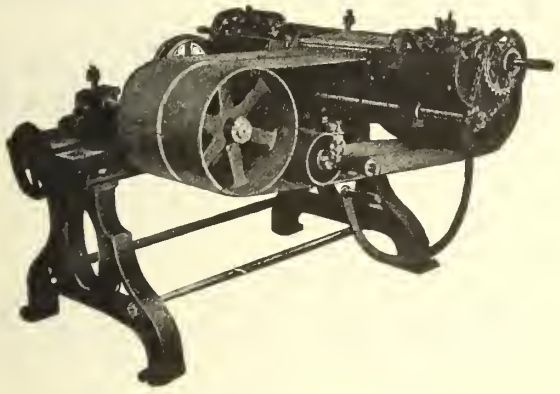
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



Give your Broom Handles a nice Smooth Finish and get Highest Prices for them. The "OBER" Automatic Sander will do the work Rapidly and Economically. We build Laths, Sanders, Rip-Saws, Bolters, chucks, Chucking Machines, etc. for making Handles of various kinds, Ball Bats, Whiffletrees, Neck Yokes, Spokes, Golf Shafts, etc.

Write for free catalogue No. 31.

The Ober Mfg. Co.

Chagrin Falls, O., U.S.A.

CLAMP NAILS DO IT

The Radio and Phonograph Cabinet Maker

Internationally known and universally adopted by the leading manufacturers of Radio and Phonograph Cabinets, as the most practical and economical method of mitered joinery.

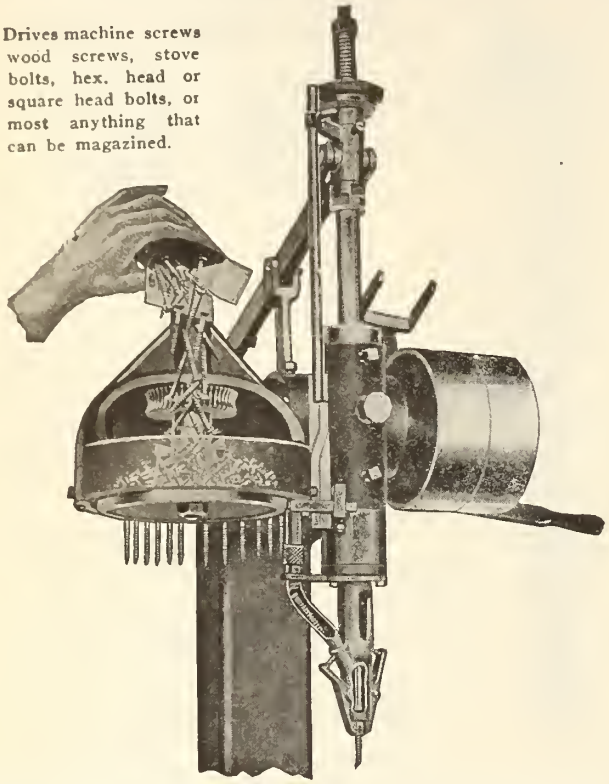
Samples and circulars on request.

CLAMP NAIL COMPANY

453 2 Palmer St. CHICAGO, U.S

The Demand is for Lower Prices!

Drives machine screws wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.



Reynolds Automatic Screw Driving Machinery will help you meet the demand

Everywhere the manufacturer is faced with the problem of price reduction. How can he find the solution?

By cutting out every waste—of time, labor materials, etc.

Many manufacturers have installed Reynolds Screw Driving Machinery for this reason. It accomplishes the work better in one-third of the time.

Consequently they are able to meet the demand for lower prices and hasten the return to normal buying.

Are you interested? Then write us to-day for the full facts.

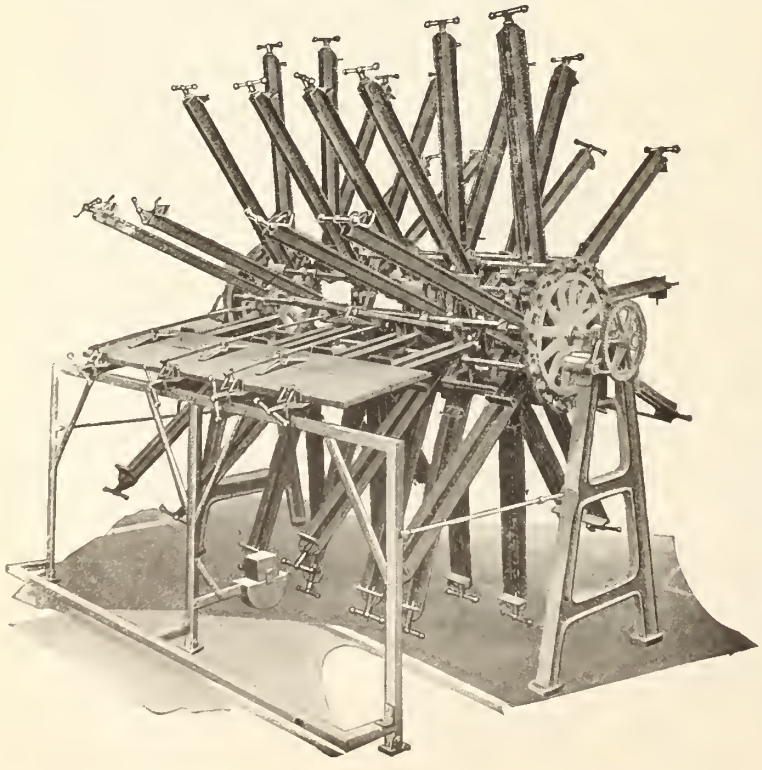
Send us dimensions over all of your work and gauge and length of screws driven so that we can determine the proper size and type machine to meet your requirements.

The Reynolds Machine Co.

Department C.

Massillon, Ohio, U.S.A.

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK

CLAMP CARRIER

for

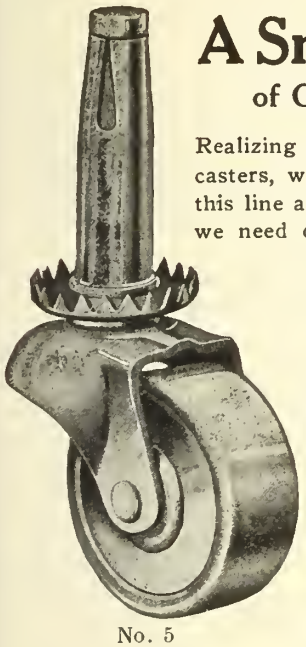
Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.


No. 5

A Small Article
of Great Importance

Realizing the importance of efficient casters, we have made a specialty of this line and as proof of their quality we need only say that many of the foremost furniture manufacturers are using them exclusively.

By the way don't it seem logical that a Canadian-made caster should be the right one to use on Canadian-made furniture? Assuming of course, that it equals the standard of the imported article?

If you believe so too, just write us for samples and prices.

National Hardware Co., Limited
Orillia, Ontario

NAILS AND WIRE
For Every Need in the Woodworking Industry

Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

Laidlaw Bale-Tie Co., Ltd

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

"The Phillips Line"
Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

Atlas Mfg. Co. of Orlando
Orlando, Fla., U. S. A.

QUALITY DRYING

Accomplished with

SPEED AND ECONOMY

Unequalled by any other kind of kiln

We will give you a guarantee to increase the capacity of your kilns regardless of present type, new or old.

Write us for Illustrated Leaflets on Kilns and Kiln Drying

GRAND RAPIDS VAPOR KILN
Grand Rapids, Michigan

Western Vapor Kiln Co , Seattle, Washington

Subscribe for the
Canadian Woodworker
and
Furniture Manufacturer
Only $2.00 per year

To Holders of Five Year 5½ per cent Canada's Victory Bonds

Issued in 1917 and Maturing 1st December, 1922.

CONVERSION PROPOSALS

THE MINISTER OF FINANCE offers to holders of these bonds who desire to continue their investment in Dominion of Canada securities the privilege of exchanging the maturing bonds for new bonds bearing 5½ per cent interest, payable half yearly, of either of the following classes:—

(a) Five year bonds, dated 1st November 1922, to mature 1st November, 1927.

(b) Ten year bonds, dated 1st November, 1922, to mature 1st November, 1932.

While the maturing bonds will carry interest to 1st December, 1922, the new bonds will commence to earn interest from 1st November, 1922, GIVING A BONUS OF A FULL MONTH'S INTEREST TO THOSE AVAILING THEMSELVES OF THE CONVERSION PRIVILEGE.

This offer is made to holders of the maturing bonds and is not open to other investors. The bonds to be issued under this proposal will be substantially of the same character as those which are maturing, except that the exemption from taxation does not apply to the new issue.

Holders of the maturing bonds who wish to avail themselves of this conversion privilege should take their bonds AS EARLY AS POSSIBLE, BUT NOT LATER THAN SEPTEMBER 30th, to a Branch of any Chartered Bank in Canada and receive in exchange an official receipt for the bonds surrendered, containing an undertaking to deliver the corresponding bonds of the new issue.

Holders of maturing fully registered bonds, interest payable by cheque from Ottawa, will receive their December 1 interest cheque as usual. Holders of coupon bonds will detach and retain the last unmatured coupon before surrendering the bond itself for conversion purposes.

The surrendered bonds will be forwarded by banks to the Minister of Finance at Ottawa where they will be exchanged for bonds of the new issue, in fully registered, or coupon registered or coupon bearer form carrying interest payable 1st May and 1st November of each year of the duration of the loan, the first interest payment accruing and payable 1st May, 1923. Bonds of the new issue will be sent to the banks for delivery immediately after the receipt of the surrendered bonds.

The bonds of the maturing issue which are not converted under this proposal will be paid off in cash on the 1st December, 1922.

W. S. FIELDING,
Minister of Finance.

Dated at Ottawa, 8th August, 1922.

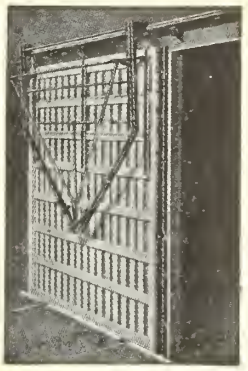
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.
Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

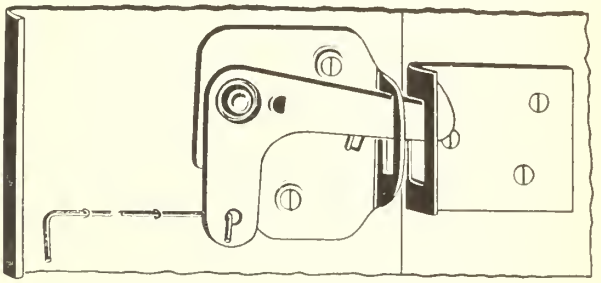
TO GET THE BEST

Use

Kasebier
KASEBIER-CHATFIELD SHELLAC CO.
KASEBIER QUALITY GUARANTEED
EST 1881
BLEACHED SHELLAC
KASEBIER QUALITY HAS EARNED ITS REPUTATION. THIS LOT WAS MADE WITH THE DETERMINATION TO KEEP IT
NEW YORK, N.Y.
Quality

Guaranteed

Kasebier-Chatfield Shellac Co.
No. 7 Cedar St., N. Y. C.



No. 22 Table Top Lock

No. 9
Mirror Stop

Furniture Trimmings and Special Hardware

We Also solicit your enquiry for Special Stampings

Larsen & Shaw, Limited
Walkerton, Ontario

OAKEY'S
Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

JOHN OAKEY & SONS LTD., WELLINGTON EMERY AND BLACK LEAD MILLS LONDON, S. E. 1.

Canadian Agents:

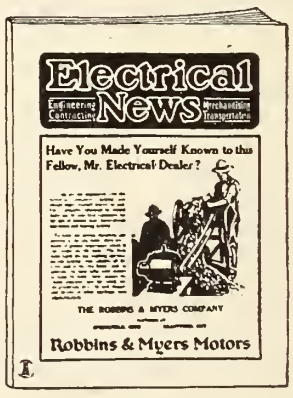
F. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

Established Business Papers

¶ Unless we felt that our papers were, even in a small way, contributing to the enlightenment and betterment of our specialized fields, we would have little excuse for existence.

¶ We believe that our papers enjoy greater prestige among representative men than any similar publications in Canada and that our advertising rates are the lowest per interested reader.

PUBLISHING HOUSE of HUGH C. MACLEAN



Hugh C. MacLean Publications

Electrical News
Canada Lumberman
Footwear in Canada

Canadian Woodworker
Western Contractor and Builder
Contract Record & Engineering Review
Commercial & Retail Merchants' Review

Furniture World
Western Lumberman
Western Coal Review

Head Office : 345 West Adelaide Street

Vancouver Chicago Toronto Montreal Winnipeg

The largest publishers of technical papers in the British Empire, printing in Toronto, Winnipeg and Vancouver. Proprietors of MacLean Building Reports Limited.

For greater production and economy in operation Simonds Saws—Circular or Band—lead the world.. Their foundation of high-grade steel plus workmanship make Simonds edge-holding, tension-holding and temper-holding.

They are the saws that millmen require.

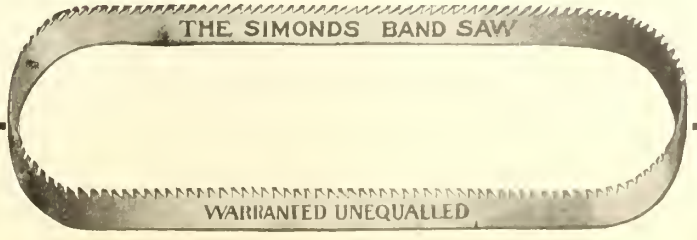
Write for catalog and prices

Simonds Canada Saw Co., Limited

"The Saw Makers"

MONTREAL, Que.

VANCOUVER, B.C. **ST. JOHN, N.B.**



The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co. Toledo, Ohio.
Paache Air Brush Co., Chicago, Ill.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARING
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Co., Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B. Hamilton Ont.

BAND SAWS
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W. Toronto.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Yates Machine Co., P. B. Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P. B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner, Mass.
Williams Machinery Co., A. R. Toronto, Ont.

BEVEL & MITRE SAWS
Pettingell Machine Co. Amesbury, Mass.

BIRCH
Edward Clark & Sons, Toronto, Ont.

BLOWERS
Canadian Blower & Forge Co. Kitchener, Ont.
Sturtevant B. F. & Co., Galt, Ont.

BLOW PIPING
Canadian Blower & Forge Co. Kitchener, Ont.

BOILERS
Engineering & Machine Works, St. Catharines, Ont.

BORING MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Sons Co., L. G., Gardner, Mass.
Nash, J. M. Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Reynolds Machine Co., Massillon, Ohio.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. R. Hamilton, Ont.
Valley City Machine Works, Grand Rapids, Mich.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co, J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CARVINGS
Klise Mfg. Co., Grand Rapids, Mich.
Decorators Supply Co., Chicago.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

CARVED WOOD MOULDINGS
Klise Mfg. Co., Grand Rapids, Mich.

CASTERS
Foster, Merriam Co., Merriden, Conn.
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Sons Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C. Indianapolis, Ind.
Shurly-Dietrich, Galt, Ont.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Sons Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company,
Taylor Mfg. Co., Jas. L. Poughkeepsie, N.Y.

CLAMP CARRIERS
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.

CRATING LUMBER
Lloyd, W. Y. Toronto, Ont.
Colborn, C. B. Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D. Guelph, Ont.

CUT OFF SAWS
Atkins & Co., E. C. Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Co., of Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rochford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Shimer Cutter Head Co., Galt, Ont..
Yates Machine Co., P. B., Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.
Richard-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Williams Machinery Co., A. R. Toronto, Ont.

DOWEL MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company,
Ober Mfg. Co., Chagrin Falls, Ohio.
Preston Woodworking Machinery Co., Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
W. S. Hawker Mfg. Co., Dayton, Ohio.

DOWELS
Canada Wood Specialty Co. Ltd., Orillia, Ont.
Rowe Mfg. Co., Newago, Mich.

DRIERS (Hot Plate)
Merritt Eng. & Sales Co., Lockport, N. Y.

DRIERS (Veneer)
Merrit Eng. & Sales Co., Lockport, N. Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont.
Cutler Desk Co., Buffalo, N. Y.
Grand Rapids Veneer Works, Grand Rapids, Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

DYNAMOS
Industrial Engineering Co., Toronto, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont
Simonds Canada Saw Co., Montreal, P.Q.

EDGER SAWS
Atkins & Co., E. C. Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

ENAMELS
Cosmos Chemical Co., Port Hope, Ont.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Garlock Machinery Ltd., Toronto, Ont.

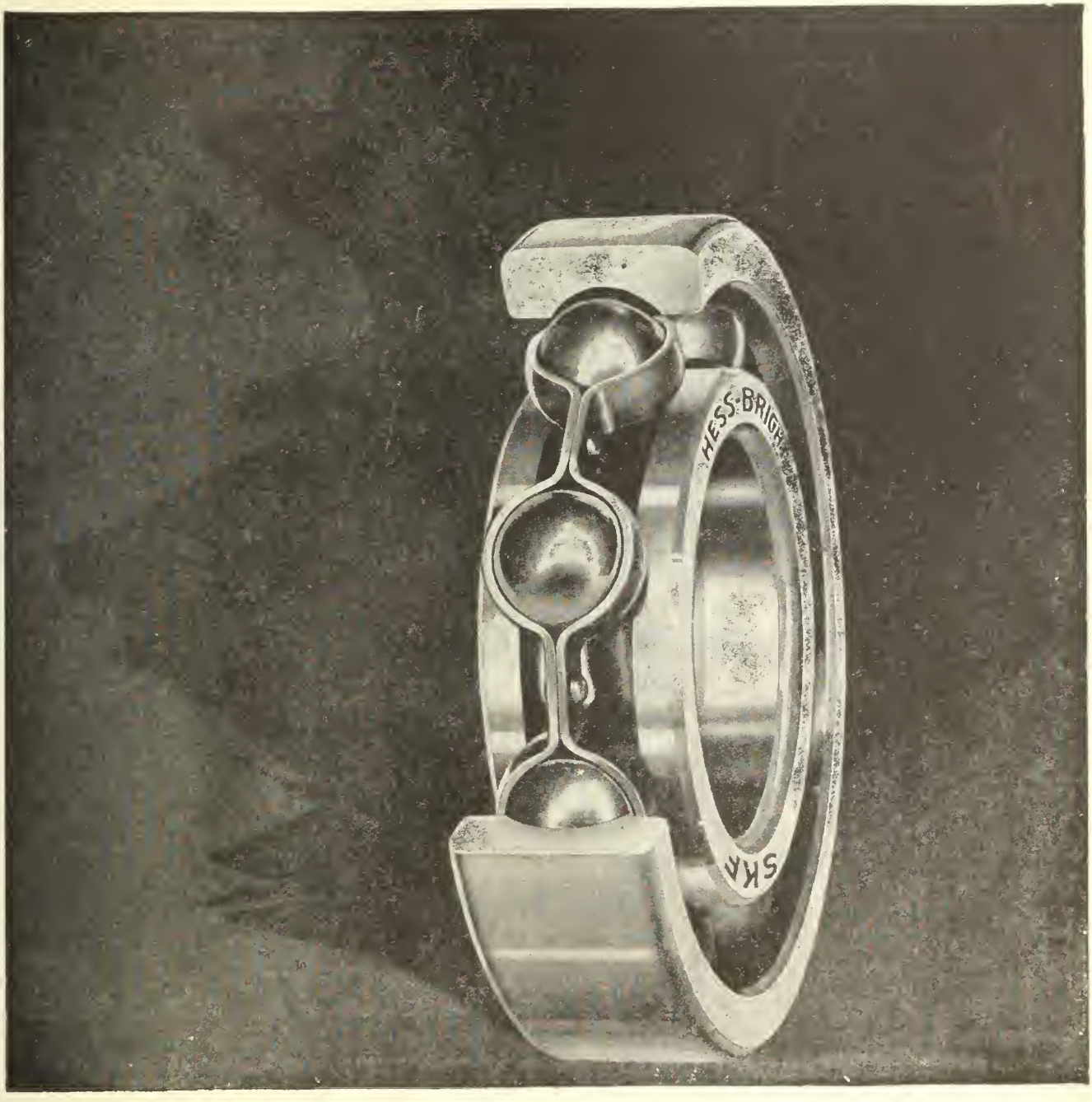
EXHAUST SYSTEMS
Canadian Blower & Forge Co., Kitchener, Ont.
Sturtevant, B. F. & Co., Galt, Ont.

FEED ROLLS
Atkins & Co., E. C. Hamilton, Ont.

FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FIBRE PRODUCTS
Carter, E. T. Toronto, Ont.
National Patent Reed Sales Co., Philadelphia, Pa.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.



The Load You Can't Estimate

NO matter how great is the foresight of the machine designer, he cannot guard against unexpected thrust loads on the bearings caused by conditions beyond his control.

The Deep Groove Bearing can withstand thrust loads greatly in excess of its radial capacity and coming from either direction.

Both the design and quality of this double purpose bearing are endorsed by the mark **SKF** and are backed by the world-wide researches and long experience of **SKF** Industries.

This experience is at your disposal and you are urged to submit your bearing problems to us for free and impartial advice.

CANADIAN **SKF** COMPANY, LIMITED

TORONTO - - MONTREAL

621

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N. Y.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.
Dominion Appraisal Co., Toronto, Ont.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.

GEARS
Hamilton Gear & Machine Co., Toronto, Ont.

GLUE
Canada Glue Co., Brantford, Ont.
Cannon Canadian Co., Toronto, Ont.
Coignet Chemical Products Co., New York, N.Y.
Kane Manufacturing Co., Chicago, Ill.
Monite Waterproof Glue Co., Minneapolis, Minn.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Taylor Mfg. Co., Jas. L. Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E. Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.

GLUE ROOM EQUIPMENT
Merritt Eng. & Sales Co., Lockport, N.Y.
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R. Toronto, Ont.

Grinders (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng. & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.

GROOVERS
Atkins & Co., E. C. Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Mattison Machine Works, Rochford, Ill.

GUM LUMBER
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W. Va.
Rush Lumber Co., Memphis, Tenn.
Thomas & Proetz Lumber Co., St. Louis, Mo.
Turner-Farber-Love Lumber Co., Leland, Miss.

HAIR (Curled)
Blocksom & Co., Michigan City, Ind.

HAND SCREWS
Fay & Egan Co., J. A. Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rochford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.

HARDWOOD DIMENSION STOCK
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER ... ...
Anderson-Tully Co., Memphis, Tenn.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr-Holaday Lumber Co., Greenfield, Ohio.
Bonner & Sons, J. H., Memphis, Tenn.
Bruce Co., E. L. Little Rock, Ark.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Clark, Edward & Sons, Toronto, Ont.
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Dudley Lumber Co. Inc., Memphis, Tenn.
Farrin Lumber Co, M. B., Cincinnati, Ohio
Frye Lumber & Veneer Co., I. W., Dayton, O.
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La.
Hafner Manufacturing Co., St. Louis, Mo.
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co., Toronto, Ont.
Kinnon Lumber Co. Ltd., Toronto, Ont.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville, Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Merceau-Hawkins Tie Co., Huntington, W. Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Otis Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Pickrel Walnut Co., St. Louis, Mo.
Richards Hardwood Co., Memphis, Tenn.
Rush Lumber Co., Memphis, Tenn.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Sullivan, Frank T. Buffalo, N. Y.
Thomas & Poetz Lumber Co., St. Louis, Mo.
Turner-Faber-Love Lumber Co., Leland, Miss.
Vail Cooperage Co., Fort Wayne, Ind.
Whiting Co., Wm. S., Johnson City, Tenn.
Wayne Lumber Co., New York, N. Y.
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng. & Sales Co., Lockport, N.Y.
Van Atta & Co., E. B., Olean, N. Y.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

Knobs
Waddell Mfg. Co., Grand Rapids, Mich.

LACQUERS
Cosmos Chemical Co., Port Hope, Ont.
Celluloid Zapon Co., New York, N. Y.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sanducky, Ohio.
Mattison Machine Works, Rochford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.

LEGS
Klise Manufacturing Co., Grand Rapids, Mich.

MACHINE KNIVES
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont

MITRE SAWS
Atkins & Co., E. C. Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.

MOTORS
Industrial Engineering Co., Toronto, Ont.

MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

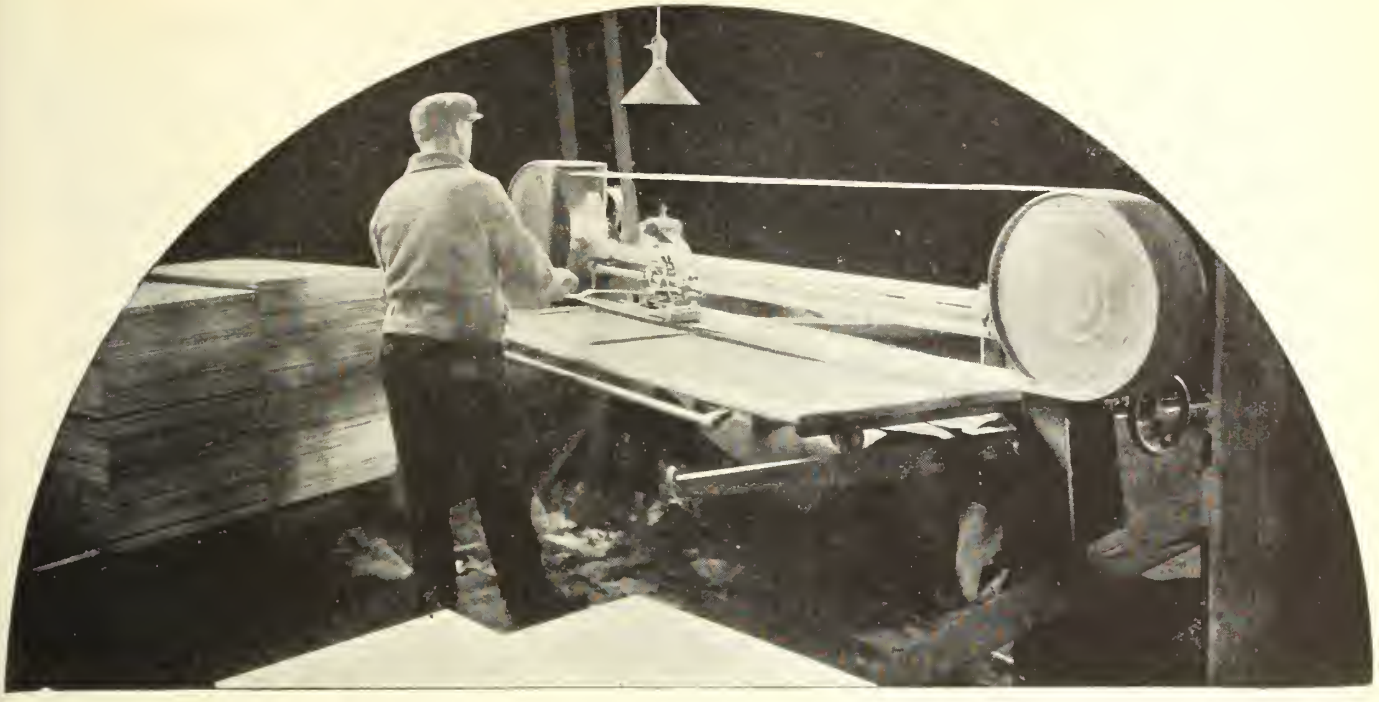
NAILING MACHINES
Morgan Machine Co., Rochester, N. Y.
Yates Machine Co., P. B., Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PAINT
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Calhoun Plywood Co., Sheboyan, Wis.
Hardwood Products Co., Neenah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rochford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.



Now They Do a Better Job of Sanding Mahogany Veneers—

IT wasn't so very long ago that the men on the sanders in a certain plant began using Carborundum Brand Garnet Belts in No. 1 grit on sanding thousands of fine mahogany veneer panels.

They had been going on the theory that garnet belts were just garnet belts and that one make was about as good as another until—

They began using belts they cut from Carborundum Brand Garnet Cloth.

Then it wasn't long before they realized that there was a difference. Now they have belts that cut speedier, cleaner, more uniformly—belts that are true and even, belts that produce more work—better work.

CARBORUNDUM BRAND GARNET PRODUCTS ALWAYS MAKE GOOD SANDERS BETTER SANDERS

The Carborundum Company, Niagara Falls, New York

New York ·· Chicago ·· Boston ·· Philadelphia ·· Cleveland ·· Detroit ·· Pittsburgh
Cincinnati ·· Milwaukee ·· Grand Rapids

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Calhoun Plywood Co., Sheboygan, Wis.
Guelph Patent Cask Co., Scotstown, P. Q.
Wisconsin Veneer Co., Rhinelander, Wis.

PERIOD MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter, E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FOLLOE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
McKenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co., Herman, Brooklyn, N. Y.

SASH, DOOR & BLIND MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SATINWOOD
Willey Co., C. L., Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P. Q.

SAW FILING MACHINERY
American Saw Filing Machine Co., Boston, Mass.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKenzie Machinery Co., D., Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW TENONERS
Pettingell Machine Co., Amesbury, Mass.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon, Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHELLAC
Kasebier-Chatfield Shellac Co.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Bruce Woodworkers Ltd., Chesley, Ont.
Walter & Company, B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis.

TEMPERATURE REGULATORS
Canadian Powers Regulators Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N. Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Klise Manufacturing Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.
Walter & Sons, J., Kitchener, Ont.

TWIST WORK
Klise Manufacturing Co., Grand Rapids, Mich.

UPHOLSTERY
Oriental Textiles Co., Oshawa, Ont.

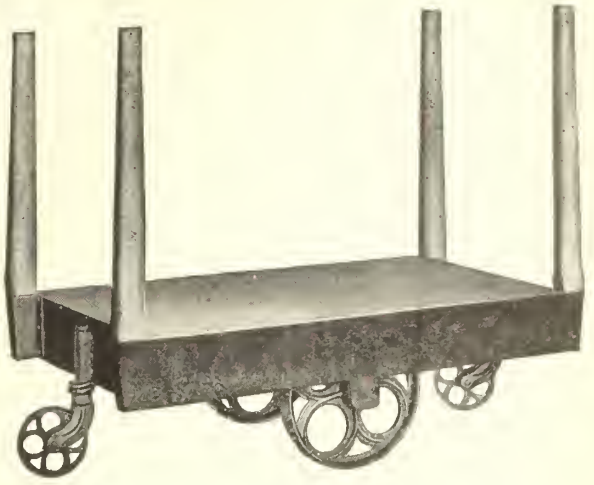
NEW AND USED
Woodworking Machinery

C.M.C. double carriage cut-off saw.
60″ Fay & Egan re-saw.
60″ Egan band re-saw.
54″ McDonough horizontal band re-saw.
42″ West Side band re-saw.
12″ C.M.C. four-side moulder.
American variety woodworker.
No. 551 C.M.C. chain saw mortiser.
18″ Defiance handle lathe.
30″ Boss double surface planer and matcher.
24″ Clark-Demill planer and matcher.
24″ Yates, single surface planer.
24″ Cowan pony planer.
20″ Preston pony planer.
48″ Berlin, three-drum sander.
42″ Invincible three-drum sander.
20″ American wood scraper.
Preston double head tenoner.
Gerlach stave machine.
Long lath bolter.

Write for full particulars and our complete stock list

H. W. Petrie, Limited
131—147 Front Street West
Toronto

NOW IS THE TIME



To Cut Your Production Cost by Using
"GLOBE"
ALL STEEL FACTORY TRUCKS
Made in 3 sizes :
24″ x 52″ 28″ x 58″ 34″ x 70″

Globe Vise & Truck Co.
GRAND RAPIDS, MICH.

BOOKS FOR SALE

The following books are offered at special prices subject to previous sale :

"Machine Molder Practice," recently published by the Practical Books Co. 172 pages, 100 illustrations. Flexible leather binding. Price $3.00.

"The Utilisation of Wood-Waste," by Ernest Hubbard, Third English revised and enlarged edition, 236 pages, illustrated. Published in 1920 by Scott, Greenwood & Son. Price $2.00.

"Modern Practical Joinery,"—A comprehensive treatise on the practice of joiner's work by hand and machine. For the use of Workmen, Builders, Machinists and Architects. Containing a full description of drawing instruments and their use; tools, appliances and apparatus; methods and processes; joints and fastenings; woodworking machines; machine shop practice; preparation of work for machining; use of the steel square; house joinery, bank, office, church, museum, domestic and shop fittings, show cases, air-tight cases, splayed and shaped work; new materials and method, stairbuilding, foremen's work, fixing, and a description of nearly 150 woods suitable for joinery. Together with a comprehensive glossary and index. By George Ellis—fourth edition, extensively revised and much enlarged. With upwards of 1400 illustrations, including 20 double page and 41 photographic plates. Recently published by B. T. Batsford Limited, 570 pages Price $12.50.

"The Kiln Drying of Lumber," a Practical and Theoretical Treatise, by Harry Donald Tiemann, M.E., M.F. Just published, by J B. Lippincott Co. 316 pages, illustrated. Price $5.00.

Seasoning of Wood; A Treatise of the Natural and Artificial Processes Employed in the Preparation of Lumber for Manufacture, with Detailed Explanations of its Uses, Characteristics and Properties, by Joseph Wagner. Published by D. Van Nostrand Co., in 1917. 274 pages, illustrated. Price $3.00.

"Modern Practical Carpentry"—For the use of Workmen, Builders, Architects and Engineers. Containing a full description of the methods of constructing and erecting roofs, floors partitions, scaffolding, shoring, centering stands and stages, coffer dams, foundations, bridges, gates, tunnels excavations, woods and half timber houses and various structural details. Together with new and simple methods of finding the bevels in roofs, setting out domes, steeples, etc. An account of failures in construction, and the theory of trussing frames. Also including a concise treatise upon timber; notes on the woods used in carpentry; various tables; a glossary of terms and phrases connected with carpentry; and a chapter on the uses of the steel square. With about 1100 illustrations. By George Ellis—second edition revised. Recently published by B. T Batsford Limited, 396 pages,—price $7.50.

Woodworker Publishing Co., Limited
345 Adelaide Street West, Toronto, Ont.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISH DRYERS
Nicholls Co., A. S., New York, N. Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Company, Robert, Toronto, Ont.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Guelph Patent Cask Co., Scotstown, P. Q.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mohawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland, Me.

Stimson Veneer & Lumber Co., Memphis, Tenn.

Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N. Y., High Point, N. C.
Wisconsin Veneer Co., Rhinelander, Wis.
Willey Co., C. L., Chicago, Ill.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.
Van Atta & Co., E. B., Olean, N. Y.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N. Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Des Moines Sawmill Co., Des Moines, Iowa.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.
Sullivan, Frank T., Buffalo, N. Y.

WASTE
Carter, E. T., Toronto, Ont.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

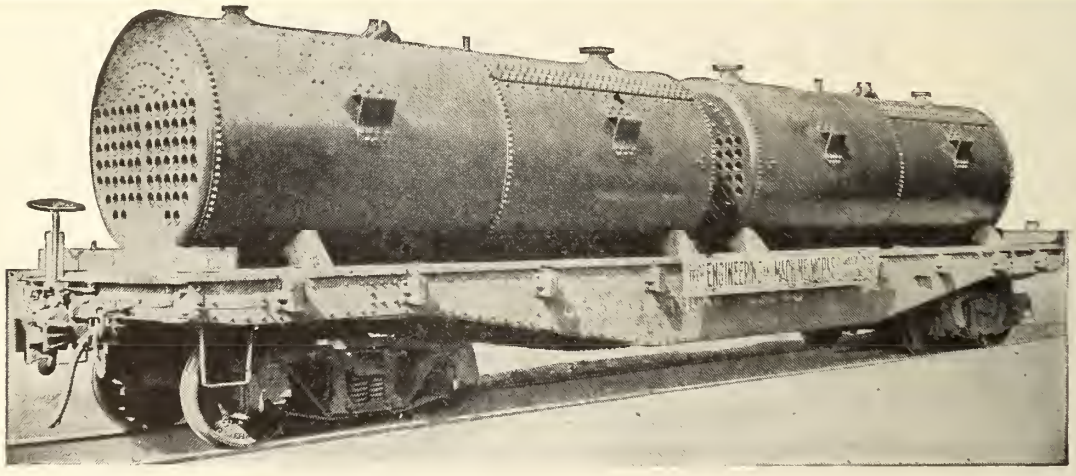
WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WOODWORKING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Elliot Machinery Co., Belleville, Ont.
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Pettingell Machine Co., Amesbury, Mass.

WOOD TURNING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Elliot Machinery Co., Belleville, Ont.
Garlock Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.



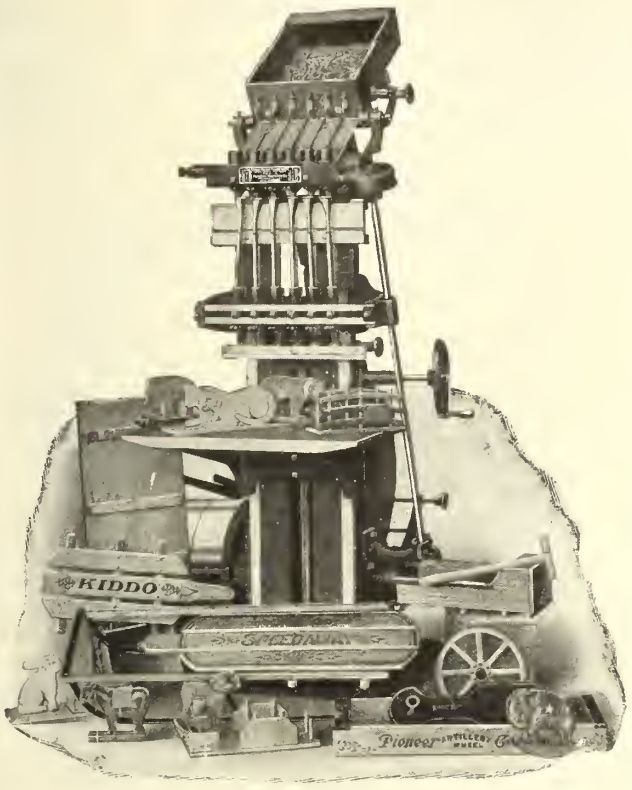
Here is a money-making suggestion for you

Let us sell you a new Boiler—or at least, equip your present ones—with our National Hand Operated Stocker—which gives wonderful economy and efficiency with low grade or waste fuels, and, being operated with a simple system of push rods, can be used by any available labour. Send for Booklet today.

Engineering and Machine Works of Canada, Limited

St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal



Morgan No. 6 Nailing Machine

MORGAN
NAILING MACHINES
Used in Nailing Wooden Toys

Many manufacturers of American Wooden Toys use our machines for driving 5/8" to 1 1/8" nails. Machines are adjustable in operation and can be adapted to any kind of nailing work.

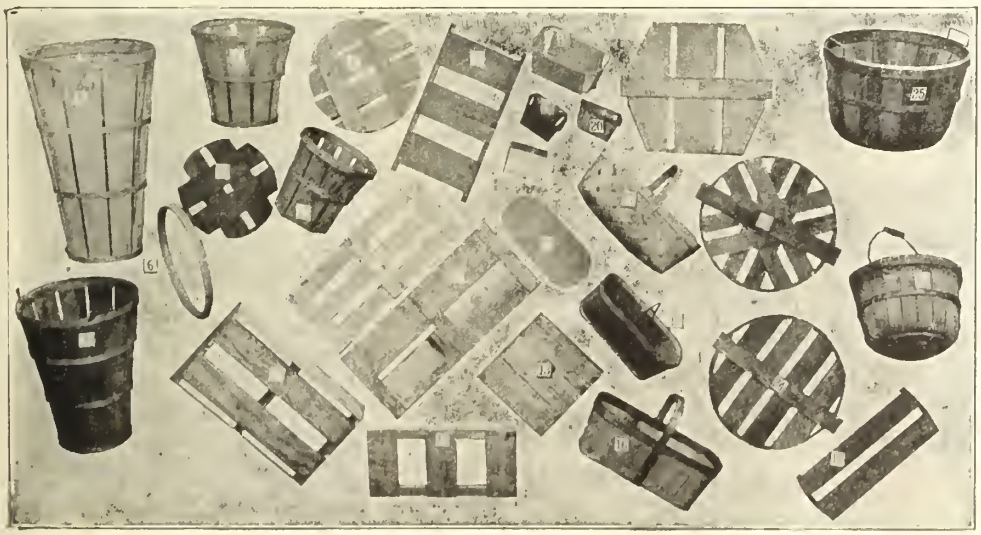
If you are driving nails by hand, in making boxes, crates, toys, any woodenware articles, figure the cost. It is expensive.

Then send us samples of your work. Get an estimate of the cost of nailing on a Morgan Nailing Machine. Compare the figures. We'll leave the rest to your judgment.

Send us your nailing problems. We shall be pleased to give them our careful consideration and advise you regarding equipment for handling them. We invite your inquiry.

Morgan Machine Company
Rochester, N. Y.

THIS IS THE NAME



of the Machinery for the Rapid Production of

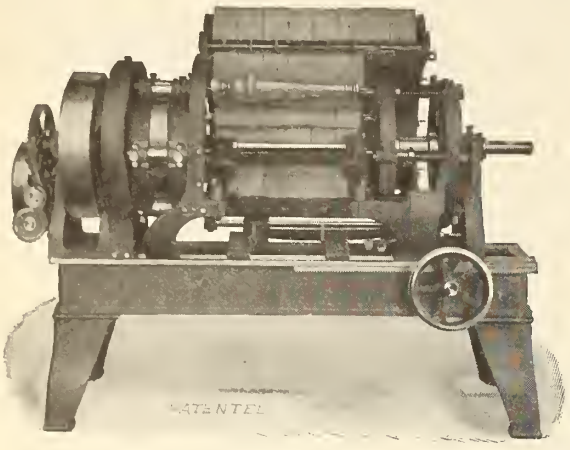
Veneer – Crates—
Baskets—Fruit Packages.

"ST JOE"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

You Are Interested



In reducing the cost of manufacturing your chairs and furniture, of course. Then you are interested in the Nash Sander for chair and furniture turnings.

You cannot make money any quicker than you can by installing this Sander and putting the savings in your pocket. Want to be shown?

J. M. NASH, Milwaukee, Wis.

MOTORS

RELIABILITY - KNOWLEDGE - PRICE

Motors—60 Cycle

1—3 H.P. Packard, 3 phase, 220 or 550 volts.
6—1/6 H.P., single phase new.
1—5 H.P. Can. Gen. Electric.
1—7½ H.P. Lincoln, and one 7½ H.P. Fairbanks.
1—10 H.P. Gen. Elec. and Lincoln.
1—20 H.P. General Electric.
1—30 H.P. newly rewound by Swedish General Electric.
4—25 H.P. General Electric.
1—50 H.P. General Electric.
1—75 H.P. General Electric.
1—100 H.P. Westinghouse and General Electric.
Above 5 H.P. motors equipped with regular starters.

Motors—25 Cycle

1—5 H.P. Crocker-Wheeler, 1500 r.p.m., 220 volts.
1—2 H.P. Langdon Davies, 1500 r.p.m., 500 volts.
1—40 H.P. Westinghouse, 720 r.p.m.
1—15 H.P. British Gen. Elec.

Other various sizes and new Westinghouse stock all sizes.

Direct Current Motors and Generators
125-250 Volts

1 K.W.
2 K.W. } Westinghouse
3 K.W. } Can. General Elec.
5 K.W. } Lincoln.
10 K.W.

Complete with rheostats and pulleys.

60 Cycle, 3 Phase Generators

60 Cycle, 3 Phase Generators
30 K.W.
50 K.W. 1200 r.p.m. General Elec. and Westinghouse.
75 K.W. Westinghouse.
100 K.W. General Elec., 2300 volts, 900 r.p.m.
300 K.W. Westinghouse, 200 r.p.m.
600 K.W. Electrical Machinery 225 r.p.m.
All. complete with exciters and rheostats.

2—175 H.P., 3 cylinder gas, gasoline or crude oil Westinghouse Vertical Engines —250 r.p.m.

Industrial Engineering Company of Canada Ltd.

CONSULTING ENGINEERS - ELECTRICAL EQUIPMENT

R. G. LEE, General Manager

Carlaw Building, Toronto - Royal Bank Building Windsor, Ont.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

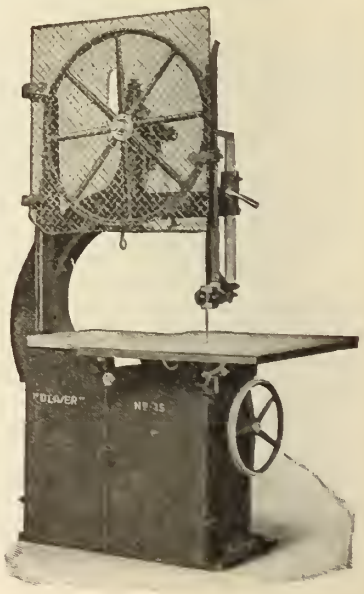
L. G. McKnight & Son Co.

GARDNER, MASS.

"Oliver" Quality

Woodworking Machinery

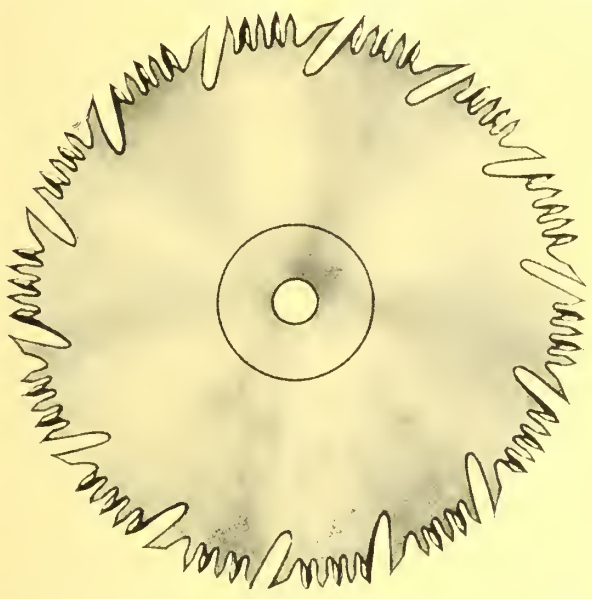
By giving cheaper makes all the "benefit of the doubt" you might justify the selection of Band Saws other than "Oliver" Band Saws. Woodworking Machinery of the "Oliver" kind may be expected to last a generation. Why not buy that kind?



Oliver Machinery Company

Grand Rapids, Mich., U.S.A.

RADCLIFF SAWS



Sold on a Service Basis

Saw Tools, Machine Knives, Hoe Shanks and Bits, Emery Wheels, Shafting, Belting, Files, Hangers and Filing Room Machinery.

Beaver Brand saws and tools are made to stand up under exceptional tension and cutting tests. Our products must embrace the finest grade crucible steel and the strictest care in tempering if they are to comply with the Radcliff Guarantee. We ask you to prove our claims of superiority. Let us mail one of our catalogs.

Our repair department is at your service. Be sure that name of owner appears on each saw, and mail full instructions of work to be done, stating the hand, speed, and feed of mill together with shipping directions for return of saws.

Agents for
L. & I. J. White Co.,
Machine Knives

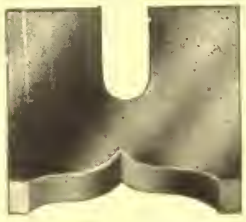
Radcliff Saw Manufacturing Company, Limited

1550 Dundas Street West **TORONTO, ONT.**

ATKINS

STERLING QUALITY

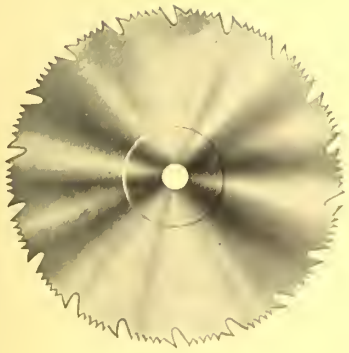
SAWS and KNIVES ECONOMIZE



ARE your saws and knives wasting your lumber? If so, why not turn that waste into a profit by installing

Atkins Sterling Quality Saws

and Machine Knives



Some of the largest woodworking mills in the country are using Atkins Saws exclusively, because they increase production, stop waste and make a name for themselves wherever they go.

Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.

E.C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

Our double-end drive with adjusting, tensioning and take-up devices, positively prevents any slap or lost motion at end of stroke.

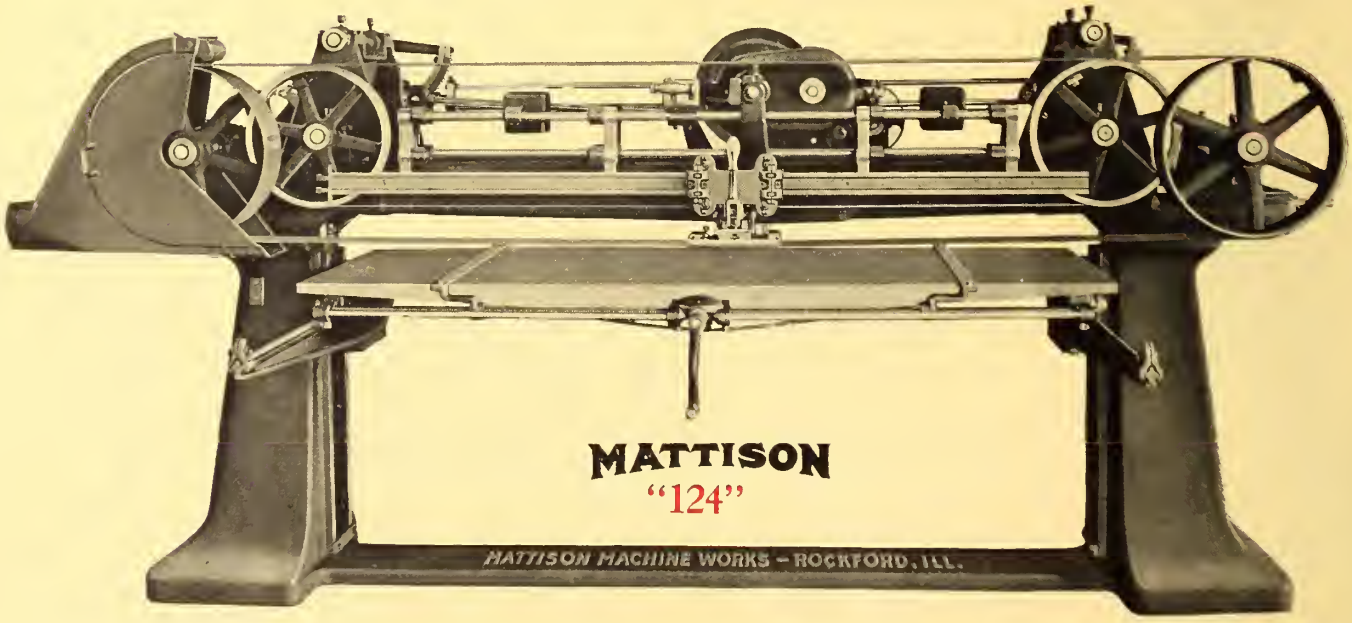
In place of the old-fashioned stranded wire cable, we employ a tempered steel driving band which cannot wear or stretch.

Automatic Sander Produces a Perfect Finish

RIGID, heavy construction, high-grade ball bearings, efficient tensioning devices and expert workmanship throughout, combine to impart an exceptional sensitiveness to the operating control. This feature, together with the flexible mounting of the sanding pad and the uniformity of stroke, produces a faultless finish with no streaks or waves to show up through the varnish.

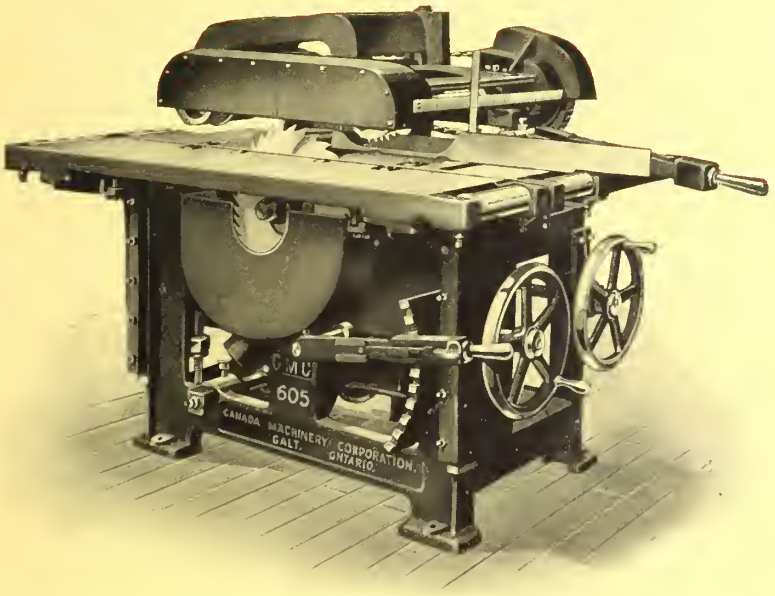
Through the combination of power stroke and hand control, the operator is enabled to manipulate the pressure shoe to suit each individual job, eliminating spoilage, increasing capacity and obtaining a finish so perfect that to further touch it by hand would spoil it.
Ask us for further evidence of its superiority.

MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.



Volume Twenty-Two TORONTO, September, 1922 Number Nine

CANADIAN WOODWORKER and Furniture Manufacturer



No. 605 Improved Self Feed Rip Saw

C.M.C.

"The Better Line"

We are satisfied that no other Self Feed Rip Saw on the market can equal the performance of this Machine. There are reasons why, and if you are interested to know these reasons, the CMC man is at your service, and would be pleased to tell you why, and we would not consider that you would be under any obligation to us in the matter.

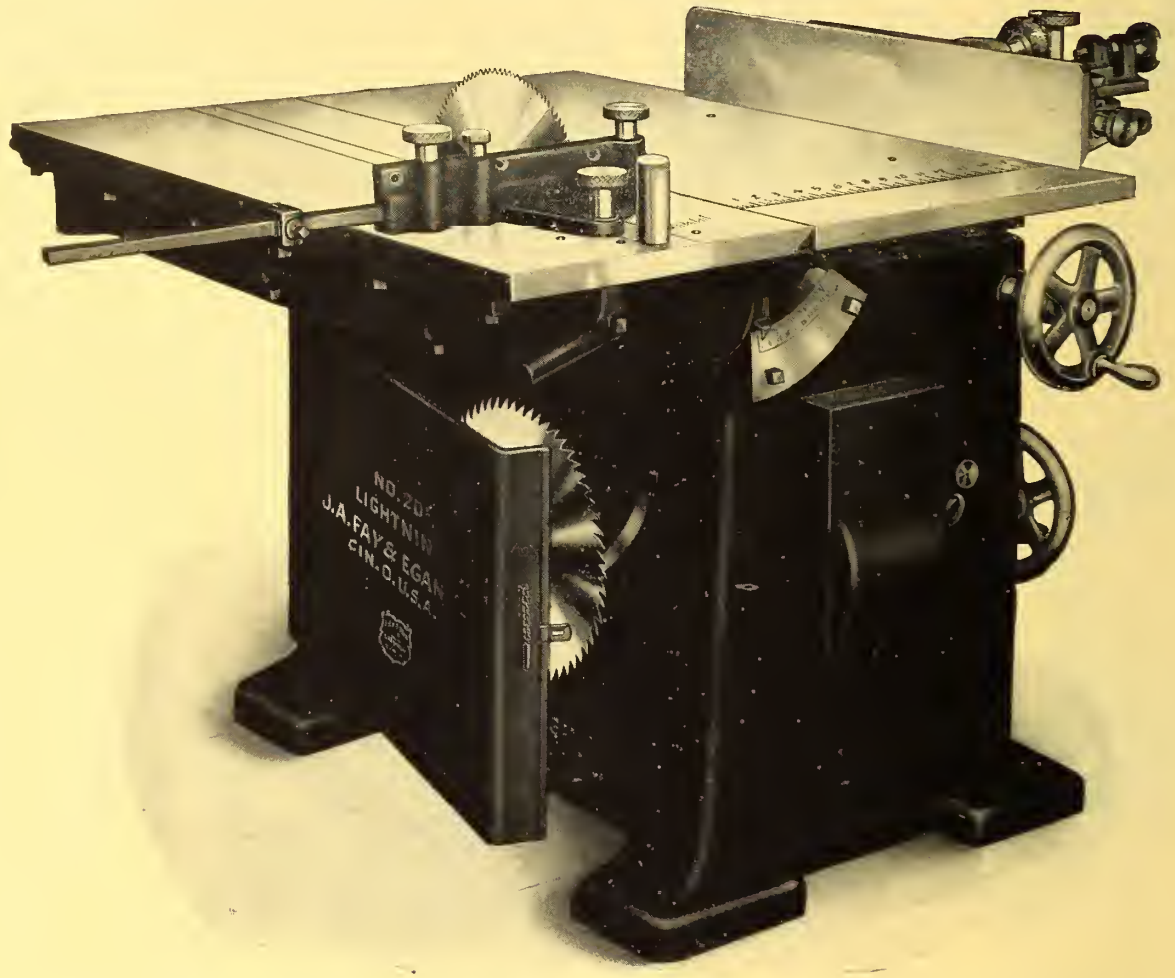
Investigation will pay

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED
Toronto Sales Office: 721 Bank of Hamilton Bldg.

Alphabetical Index to Advertisers, Page 12

The Cabinet Makers Favorite

No. 205 "Lightning" Universal Saw Bench



Its Unlimited Application makes it essential to every shop

Send now for complete information
and illustrations of this machine

J. A. Fay & Egan Company

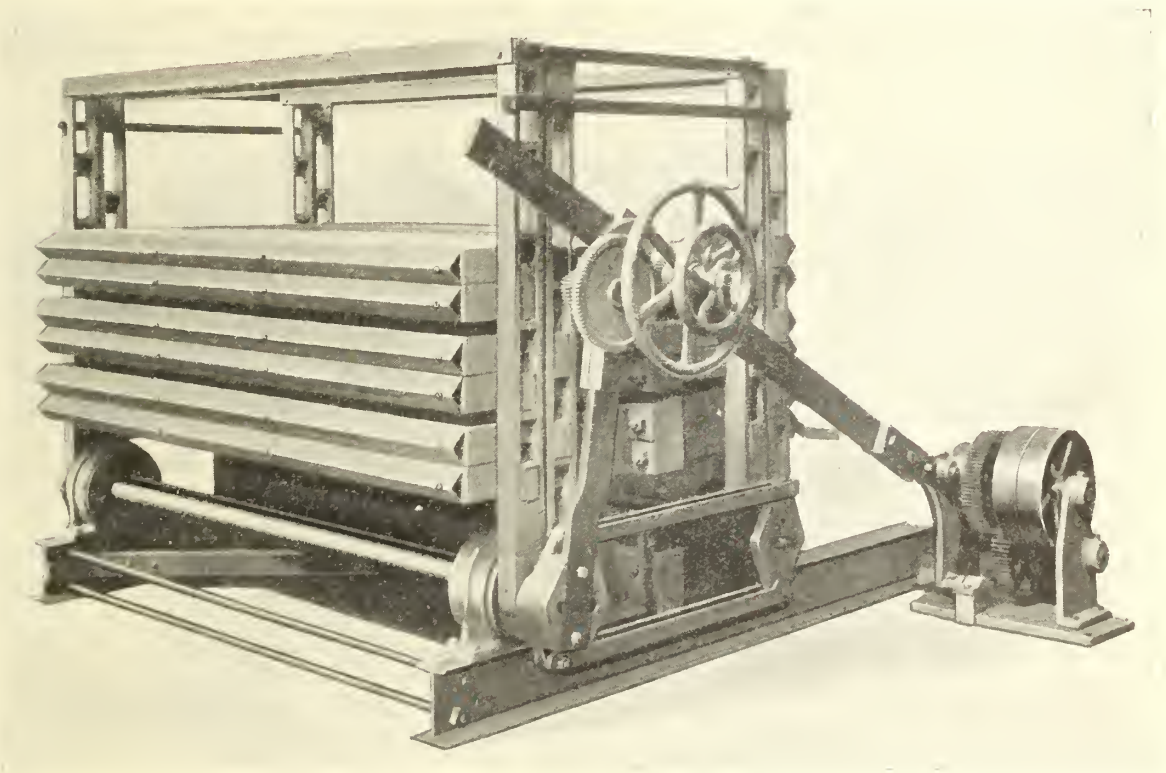
ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St. - - Cincinnati, Ohio, U. S. A.

Exclusive Agents for the Dominion: A. R. Williams Machinery Company, Ltd., Toronto, Ont.
Branches: Montreal, St. John. N. B., Winnipeg, Vancouver

Shrinkage How it Affects Veneer



Take ordinary air dried veneer. It contains anywhere from 8% to 15% moisture. It is as dry as the air but no drier.

It is then passed through the glue spreader. Immediately it absorbs additional moisture and consequently contains more moisture than does the air.

After a time your glued up panel suffers as a result. The air being drier than the panel, the veneer begins to dry out and to shrink gradually. Open joints and fine checks appear; blisters occur; warping takes place and often the panel must be replaced.

How different when veneer is re-dried by the Perrin Veneer Re-Drier. Hot plates, steam heated, draw out the moisture left in by the air-drying process. The veneer becomes drier than the air so that even after it has been through the glue spreader, it still contains no more than the normal amount of moisture. Veneer applied after being Perrin re-dried makes a permanent job. No after-troubles occur.

Are your panels going out in the proper condition?

The Perrin Veneer Re-Drier is simple to operate. It is suitable for any plant and its capacity can be increased as occasion demands. Why not ask us for fuller particulars.

MADE IN CANADA BY CANADIAN WORKMEN

GARLOCK MACHINERY LIMITED

WOOD WORKING AND METAL WORKING MACHINERY

163 DUFFERIN ST. TORONTO TELEPHONE, PARKDALE 7855

Specialists in Wood Working Machinery

All you ever knew about a Lumber Kiln is out of date. You can't select today the best kiln from past experience. Your best friend's advice wouldn't be any better.

You owe it to yourself to investigate the results obtained from Cutler Kilns. For the last two years our customers have been drying lumber in half the time required by the best of other kilns — and getting better lumber.

We can furnish records of actual Kiln runs — or show you kilns in operation.

Either one will convince you of the wonderful improvements over the old methods. — Write Us.

All essential features of Cutler Kilns are fully protected by mechanical and process patents granted and pending.

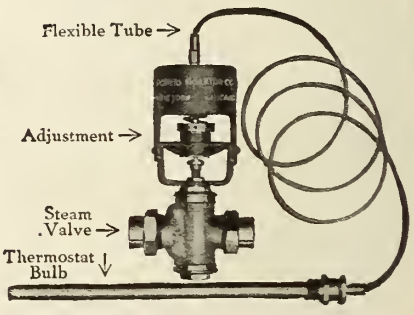
CUTLER DESK COMPANY
Dept. F. Buffalo, N. Y.

Cutler
DRY KILN
Better Drying in half the time

Controlling Heat For Industry

Powers Regulation, installed on any system of artifical heat, insures economy, safety, and the correct temperature.

Regardless of the kind of temperature to be controlled—whether of liquid or air —or for what purpose—there is a Powers Regulator specially adapted to that purpose—for controlling the temperature of a single room or an entire building—for vats—ovens—dryers—dyers—kilns —glue pots—varnish rooms—and many other places where heat control is necessary for best results.



The Powers Regulator No. 11

Specially adapted for the control of liquid temperatures as in hot water tanks, acid baths, glue pots, dye kettles, etc. Entirely automatic and self-contained, requiring no outside power for operation. Send for Bulletin 129. Other designs for other uses, wherever heat control is desirable.

Powers Regulators save time, conserve energy, protect material in process of manufacture. They are automatic, dependable, accurate.

Powers Regulation is the result of more than 30 years of labor in this one field. Let us help you in meeting today's manufacturing problems.

The Canadian POWERS REGULATOR CO. LTD.
Specialists in Automatic Heat Control

82 Chestnut Street — Toronto, Ont.

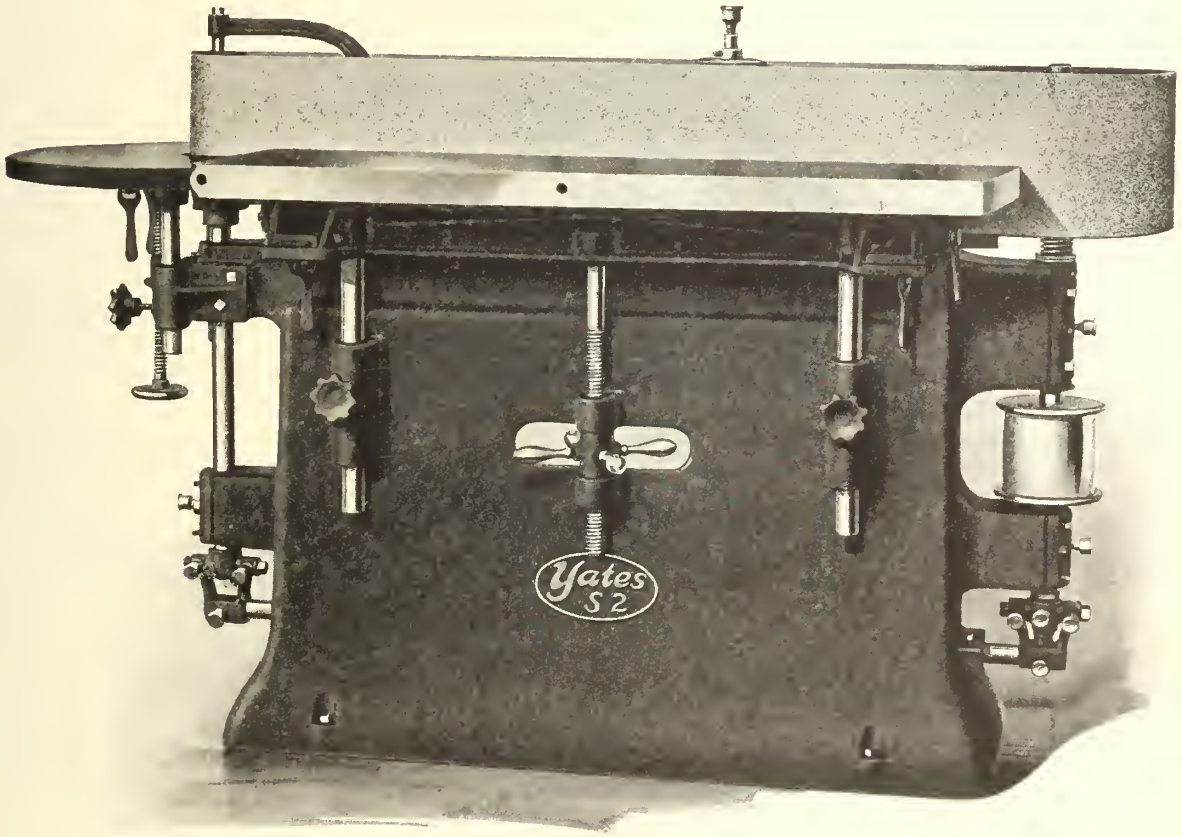
Calgary, Alta. - Halifax, N.S. - Montreal, Que.
Vancouver, B.C. - Winnipeg, Man.
Please consult your Telephone Directory for local address

(1818)

YATES

TYPE S-2

EDGE SANDER



The Type S2 is a very useful machine for furniture factories and woodworking shops, for sanding straight stuff as well as handling all the irregular shapes. Main tables can be tilted for sanding stock with bevelled edges.
Drums oscillate which gives stock a fine and even finish removing ridges and scratches which would otherwise appear if sand belt ran straight. A 10 inch sand belt is regularly furnished. Gladly send you circular with full particulars on this machine upon hearing from you.

P. B. Yates Machine Co. Limited

Hamilton - Canada

"WILLIAMS"

List of New and Used Woodworking Machinery

In Stock For Immediate Delivery

No. 50530. New 30" Cowan Band Saw.
50577. Refitted No. 155 42" Jackson Cochrane Band Rip and Edging Saw with 4" blade, can be used as a Re-saw or straight Band Saw.
51984. New Moak, 36" Band Saw, with aluminum top wheel.
50983. New 20" Preston Jointer, with rd cyl., with c/s.
51131. New C.M.C. 12" Jointer, with rd. cyl.
Used 12" McGregor Gourlay Jointer with sq. cyl.
48845. New genuine new Britain Chain Mortiser with plain table.
48850. Used 42" Berlin Invincible 3 drum Sander, with power raising rolls and spiral drums.
48236. Used C.M.C. No. 107 Planer and Matcher.
48963. Used 24" long bed type Planer and Matcher.
Used 24" Handy, short bed type, Planer and Matcher.
51248. New No. 112 Fay and Egan Flooring Planer and Matcher.
44916. Used Cowan 26" Double Surfacer.
44720. Used McGregor Gourlay 26 x 10 (like C.M.C. No. 216) Double Surfacer.
51620. Used No. 177, 30" Berlin Double Surfacer with divided rolls.
50159. New Preston No. 127 Dimension Saw Table, raising lowering arbor, carries 16" or 18" saw..
51152. New No. 125 Preston Saw Table with boring and mortising attachment.
Used No. 10 Ober Lathe for broom handles etc.
Used Ober Axe Handle Lathe.
44960. New Preston No. 162 High Speed Ball bearing shaper.

Phone Woodworking Department—Adelaide 20

The A. R. Williams Machinery Co., Ltd.

Dept. C.W., 64 Front St. W., Toronto

Halifax - St. John - Montreal - Winnipeg - Vancouver

If it's Machinery—Write "Williams"

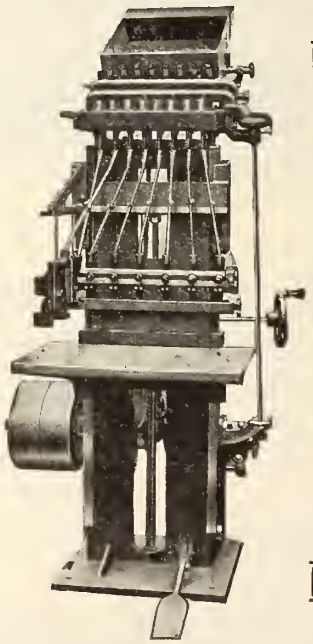
MADE IN SCOTLAND

ENTIRELY AUTOMATIC

EASILY OPERATED

MACHINES FOR PLAIN

OR ZIGZAG NAILING



BOX NAILING AND

CLEATING MACHINES

ALSO MADE FOR

CLEATING or BATTENING

INSTANTLY ADJUSTED

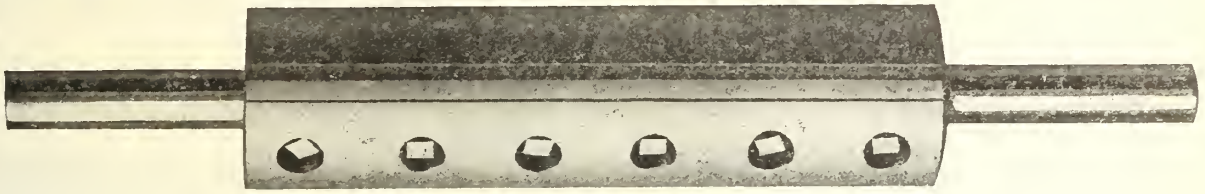
MADE IN ALL SIZES

MAY WE SEND YOU A CATALOGUE?

MATTHEW WYLIE & Co. Ltd.

81 PORTMAN STREET, GLASGOW

The Shimer Round Safety Cylinder with High Speed Knives



A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

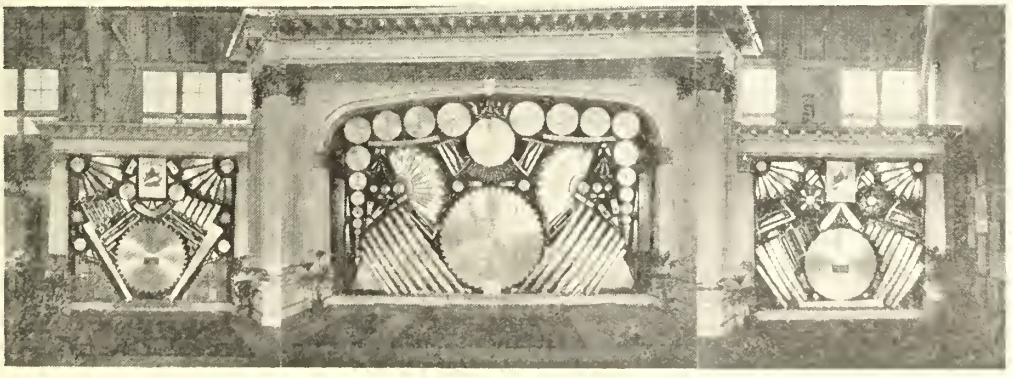
WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

MAPLE LEAF SAWS



A Saw For Every Purpose

Used by all the principal Woodworking & Furniture Mfgs.

Throughout Canada

Cross-Cut Saws
Band Saws
Dado Heads

Special Saws
for
Special Work

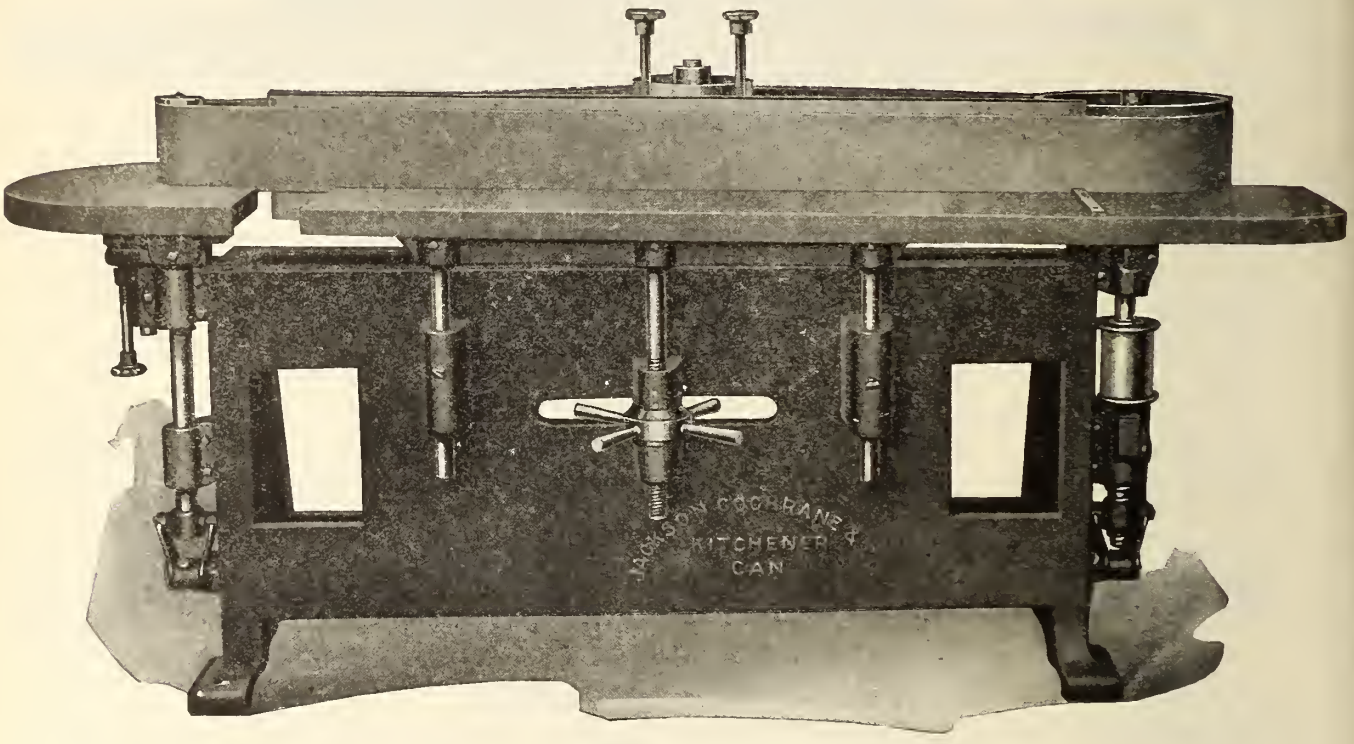
Circular Saws
Hand Saws
Woodworking Cutters and Knives

Manufactured by

SHURLY-DIETRICH, LIMITED, The Largest all-Canadian Saw Manufacturers

GALT, Ontario

No. 272 OSCILLATING



No. 272
Oscillating Belt Sander for Edged and Shaped Work

This style of belt sander has a capacity several times greater than sanding drums or spindles. The high speed sand belt covers a long surface and retains its sharp and fast cutting properties. The long travel of the belt gives it an opportunity to cool off between contacts, whereas on drums and spindles, where the sanding surface is small, the wear is continuous and in one place.

It will also finish practically any piece of straight or bent work that can be supported on the tables or held against the platen or sanding rolls.

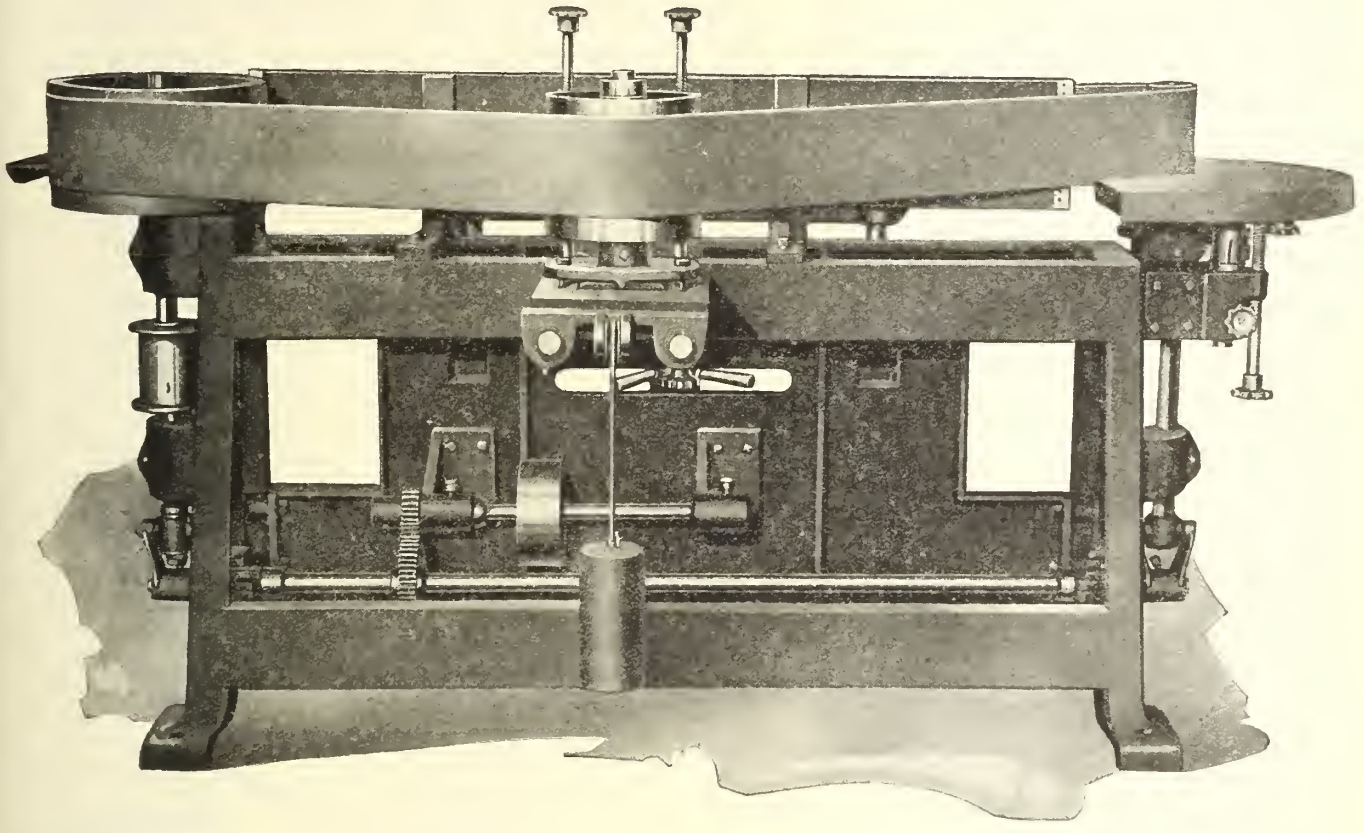
The design and construction eliminates all chance of vibration, thus insuring a perfect sanding contact. The tables provide an even and accurate support for the work, and as the belt travels with an oscillating movement, a perfect finish is assured.

The tables are the proper height and permit the operator to handle his work in a natural position. Numerous sizes of sanding rolls, special forms for shaped work and non-revolving sanding spindles may be used for sanding a large variety of work. The long platen between the sanding pulleys may be removed and replaced with special forms for any work having rounded edges.

This sander is so constructed that a number of stationary forms may be used for special work.

Jackson, Cochrane & Co

BELT SANDER



Features of our No. 272 Oscillating Belt Sander

Heavy construction eliminates vibration.

Long belt surface prolongs life of sand belt.

Oscillating movement prevents scratch marks.

Belt pulleys covered with heavy coating of rubber provides a good driving surface and a perfect sanding cushion.

Large tables and each adjusted independently of the other.

S.K.F. ball bearings in small belt pulley.

Improved belt tightening device.

Convenience of operation.

Large capacity.

Very moderate price.

Large descriptive circulars now ready. Send for one and get full particulars on this Sander.

SPECIFICATIONS

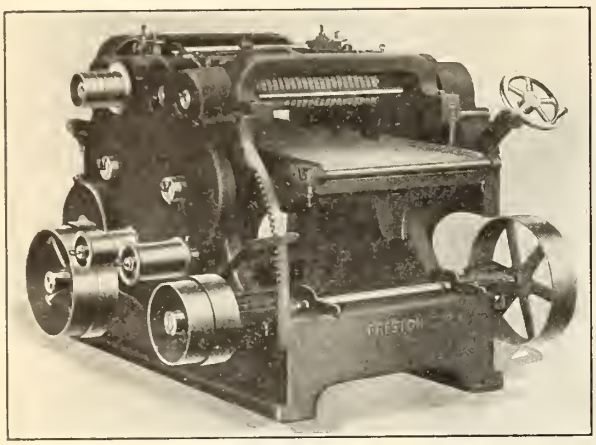
Large Sand Belt Pulley....14" dia. x 8½" face
Small Sand Belt Pulley...3½" dia. x 8½" face.
Circular Table.....25" wide.
11" from spindle to end.
19" long overall.

Long Table.....72" x 12".
Platen.....60" long 9½" wide.
Centre to centre of pulleys 72"
Idler Pulley.....10" dia. x 9" face.
Floor space.....8' x 3' 6".

Manufacturers of Woodworking Machinery

Kitchener, Ont.

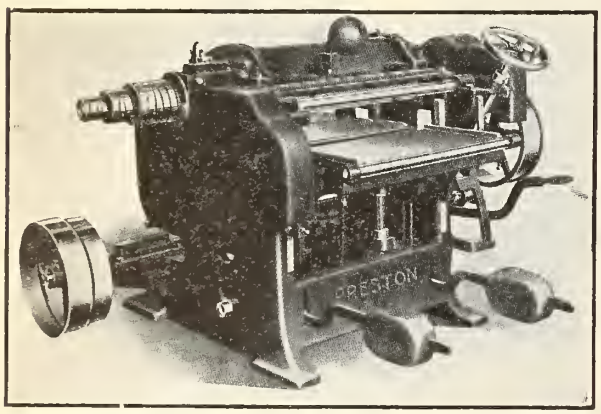
"Preston" Woodworking Machines Mea



No. 123 "Preston" High Speed Ball Bearing Surface Planer

This cut shows planer equipped with specially selected S.K.F. ball bearings, sectional roll, and sectional chipbreaker, round cylinder with four high speed knives, and arranged to receive Stockridge electric knife grinder and jointer. Cylinder speed, 5,000 R.P.M.

Two points are guaranteed: (1) It will reduce your sanding costs (2) It will increase your production.



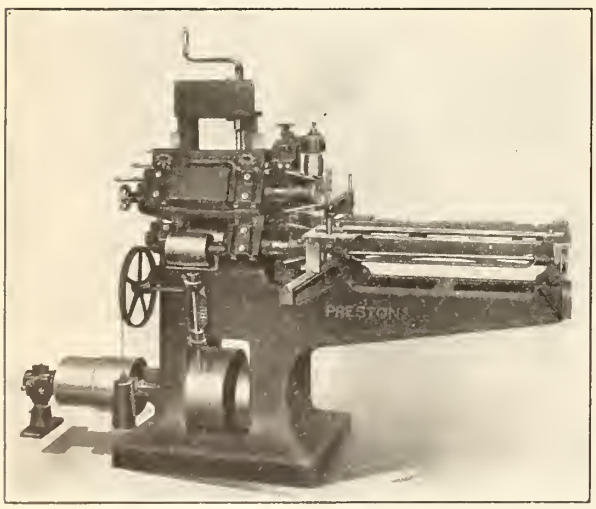
No. 121 "Preston" Heavy Pony Planer

This cut shows standard machine. Can be built with:

(1) Straight roll or divided rolls or sectional roll and chipbreaker.

(2) Square cylinder or round 4 knife cylinder.

(3) Babbit Bearings or S.K.F. Ball Bearings.



No. 184 "Preston" Tenoning Machine

Features of Construction.

(1) Genuine Whitney self-lubricating bearings.

(2) Powerful belt drive.

(3) Large heavy base and very rigid in all parts.

(4) Practically all adjustments made from front of machine.

The Preston Woodworking

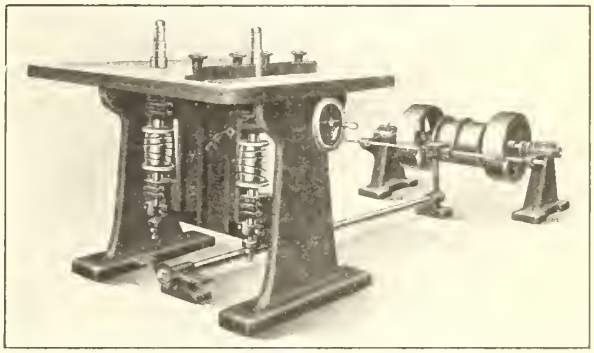
PRESTON,

We are Sole Manufacturers of and Agents in Canada for the Eaglesfield Patented Beltless Swing Saw

arger Output and Lower Expense

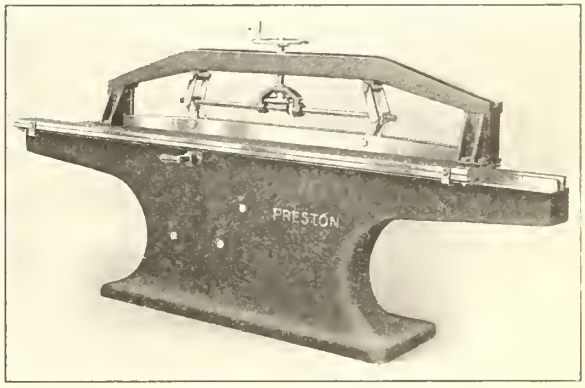
No. 164 "Preston" Ball Bearing Shaper

Designed to meet the requirements of concerns needing a lighter and less expensive Shaper than our No. 162.
Made with:
(1) Babbit bearings, plain countershaft.
(2) Ball bearings, plain counter-shaft.
(3) Ball bearings, special countershaft.



No. 181 "Preston" Veneer Jointer

The only veneer jointer that will effectively joint buckled veneer. Designed for the purpose of making commercially perfect face joints, butt or crosswise, as well as lengthwise of the grain on the highest figured Circassian Walnut or Crotch Mahogany Veneer. As rigidity is an essential feature of this type of machine, special care was taken in its construction. The frame, which is of cored section, is cast in one solid piece.

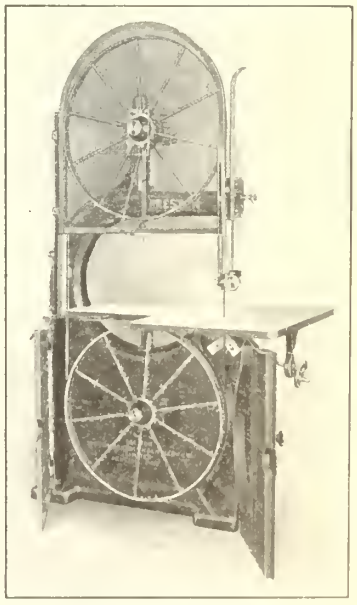


Eaglesfield Patented Ball Bearing Motor-driven Beltless Swing Saw

The special features of this saw are evident from the illustration. The motor is attached directly to the saw mandrel, which is supported in S.K.F. ball bearings. No belts or gears are used and the saw may be hung anywhere, regardless of the position of the shafting.

No. 132 "Preston" 36" Band Saw

Made with or without guards. The wheels are all steel, covered with solid rubber bands, ¼ in. thick. Solid web lower wheel is supplied when desired.
We guarantee that breaking of saws will be reduced to a minimum on this machine by reason of our almost perfect tension device and style of guide.
Supplied with 3 H.P. motor for individual drive if desired.



Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

Alphabetical List of Advertisers

Adjustable Clamp Co. 105
Atlantic Lumber Co. 48
Atkins & Co., E. C. 115
Atlas Mfg. Co., of Orlando 104

Bachman Co., F. M. 90
Batavia Clamp Co. 105
Banning, Leland G. 49
Behr Co., Inc. Herman 27
Bigelow-Cooper Lumber Co. 43
Barr-Holaday Lumber Co. 35
Bell Machine Co. 26
Birds Eye Veneer Co. 78
Black Bros. Co., ... 102
Blocksom & Company 71
Bruce Woodworkers Ltd. 31
Bruce Company E. L. 38
Brown Corporation 34
Buffalo Hardwood Lumber Dealers 42
Bury & Co., Robt. 50

Canada Machinery Corporation 1
Canada Wood Specialty Co. 46
Canadian Appraisal Co., Ltd., The 21
Canadian Blower & Forge Co. 114
Canadian General Lumber Co. 95
Canada Glue Co. 18
Canadian Powers Regulator Co. 4
Canadian Nashua Paper Co. 32
Canadian S. K. F. 107
Cannon Canadian Co., Ltd. 18
Connor J. H. & Sons Ltd. 46
Carborundum Co. 109
Carter & Co., E. T. 76
Casein Mfg. Co. 18
Celluloid Zapon Co. 76
Chapman & Dewey Lumber Co. 32
Clamp Nail Co. 105
Clarke Edward & Sons, Ltd. 44
Coignet Chemical Products Co. 18
Colborn, C. B. 40
Comfy Cushion Co. 71
Cosmos Chemical Co. 21
Cowan & Co. 12
Cutler Desk Co. 4

Decorators Supply Co. 20
Delaney & Pettit Limited 72
Des Moines Sawmill Co. 36
DeVilbiss Mfg. Co. 77
Dominion Appraisal Co. 21
Doon Twines 72
Dry Kiln Door Carrier Co. 103

Eagle-Ottawa Leather Co. 70
Eaton & Sons J. R. 39
Engineering & Machine Works of Canada Ltd. 112

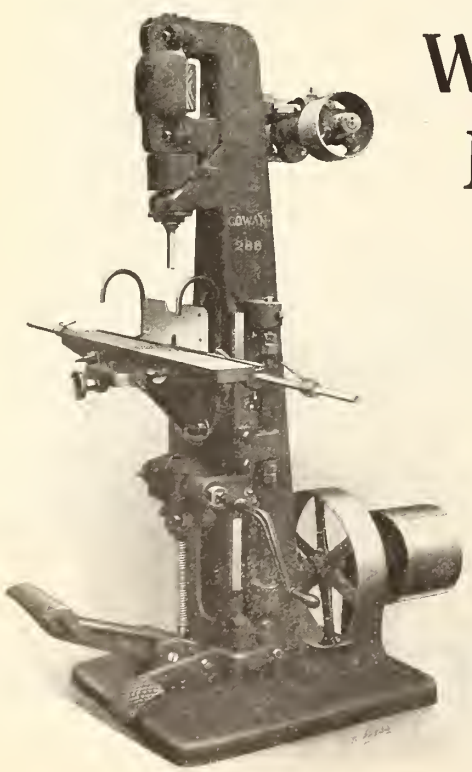
Farrin Lumber Co., The M. B. 50
Fay & Egan Co., J. A. ..... 8..... 2
Foster, Merriam Co. 22
Garlock Machinery Ltd. 3
General Machinery Co. 97
General Hardwood Lumber Co. 31
Globe Vise & Truck Co. 111
Grand Rapids Vapor Kiln 104
Guelph Patent Cask, Co., Ltd. 85
Gulf Lumber & Trading Co. 41

Hardwood Mfg's. Institute .....
Hafner Mfg. Co. 46
Hartzell, Geo. W. 37
Hay & Co. 93
Hay & Co., Peter 97
Hawker Mfg. Co., W. S. 25
Hoffman Bros. Co. 83
Hyde Lumber Co. 40

Ideal Fence & Spring Co., of Canada Ltd 71
Industrial Engineering Co. 114

Jackson Cochrane & Co. 89

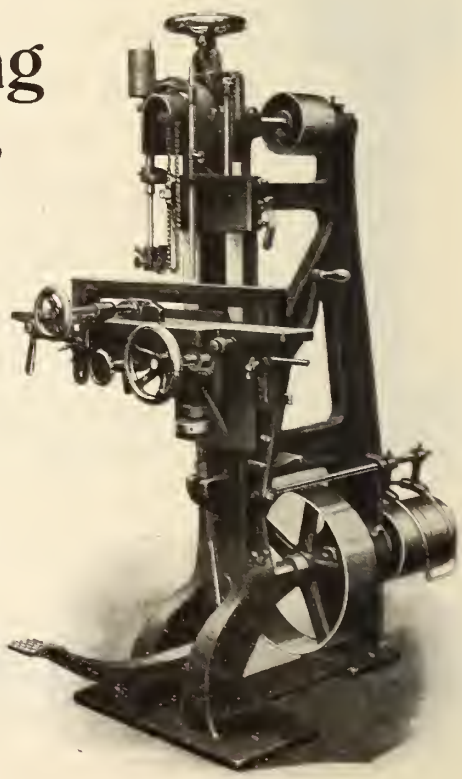
Kane Mig. Co. 20
Kaebier Chatfield Shellac Co. 103
Kinnon Lumber Co. 97
Klise Mfg. Co. 24
Klotz Machine Co. 29
Kosse, Shoe & Schleyer Co. 41
Kraetzer-Cured Lumber Co. 99



Woodworking Machinery

COWAN'S

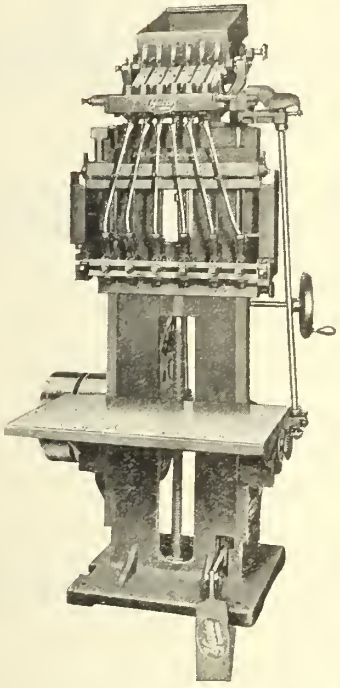
GALT
Ontario
Canada



Vertical Hollow Chisel Mortiser 288

Chain Saw Mortiser 255

YATES
NAILING MACHINES



Entirely Automatic—Quickly Adjustable
Easily Operated

Open and Closed Back Types built in many different sizes

Ask about our
New A. B. Box Nailing Machine

Nails the sides to end of box simultaneously.
Makes a box in three Strokes.

Don't hesitate to ask for further information. We'll gladly supply it

P. B. Yates Machine Co. Ltd.
Hamilton, Ontario

BOOKS FOR SALE

The following books are offered at special prices subject to previous sale:

"Machine Molder Practice," recently published by the Practical Books Co. 172 pages, 100 illustrations. Flexible leather binding. Price $3.00.

"The Utilisation of Wood-Waste," by Ernest Hubbard, Third English revised and enlarged edition, 236 pages, illustrated. Published in 1920 by Scott, Greenwood & Son. Price $2.00.

"Modern Practical Joinery,"—A comprehensive treatise on the practice of joiner's work by hand and machine. For the use of Workmen, Builders, Machinists and Architects. Containing a full description of drawing instruments and their use; tools, appliances and apparatus; methods and processes; joints and fastenings; woodworking machines; machine shop practice; preparation of work for machining; use of the steel square; house joinery, bank, office, church, museum, domestic and shop fittings, show cases, air-tight cases, splayed and shaped work; new materials and method, stairbuilding, foremen's work, fixing, and a description of nearly 150 woods suitable for joinery. Together with a comprehensive glossary and index. By George Ellis—fourth edition, extensively revised and much enlarged. With upwards of 1400 illustrations, including 20 double page and 41 photographic plates. Recently published by B. T. Batsford Limited, 570 pages. Price $12.50.

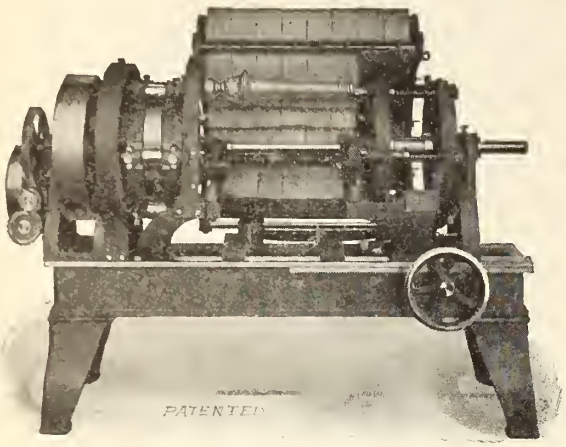
"The Kiln Drying of Lumber," a Practical and Theoretical Treatise, by Harry Donald Tiemann, M.E., M.F. Just published, by J B. Lippincott Co. 316 pages, illustrated. Price $5.00.

Seasoning of Wood; A Treatise of the Natural and Artificial Processes Employed in the Preparation of Lumber for Manufacture, with Detailed Explanations of its Uses, Characteristics and Properties, by Joseph Wagner. Published by D. Van Nostrand Co., in 1917. 274 pages, illustrated. Price $3.00.

"Modern Practical Carpentry"—For the use of Workmen, Builders, Architects and Engineers. Containing a full description of the methods of constructing and erecting roofs, floors partitions, scaffolding, shoring, centering stands and stages, coffer dams, foundations, bridges, gates, tunnels excavations, woods and half timber houses and various structural details. Together with new and simple methods of finding the bevels in roofs, setting out domes, steeples, etc. An account of failures in construction, and the theory of trussing frames. Also including a concise treatise upon timber; notes on the woods used in carpentry; various tables; a glossary of terms and phrases connected with carpentry; and a chapter on the uses of the steel square. With about 1100 illustrations. By George Ellis—second edition revised. Recently published by B. T Batsford Limited, 396 pages,—price $7.50.

Woodworker Publishing Co., Limited
345 Adelaide Street West, Toronto, Ont.

Improved Methods



of manufacture are of vital interest to the modern manufacturer.

The NASH SANDER for chair and furniture turnings is the last word in sanding equipment. As a labor saver and quality producer it is without an equal.

J. M. NASH, Milwaukee, Wis.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.

IF you plan to remodel your kiln, our literature will help you —also your operator.

EVERY big new flooring plant built this year to dry hardwoods has chosen The Standard Dry Kiln except only one—consider what that means in the hardwood field.

What is a "Circulator?"
Do you know how it cuts down drying time—how it prevents checking? Ask for our free literature on this—it will pay you.

THE DRY KILN THAT DOES NOT Disappoint

The Only Heating System having ***both*** advantages—horizontal piping ***and*** also division into units.

Are you on our free mailing list? Get on—!

THE STANDARD DRY KILN

For literature on any points of drying or your problems, write us at 1542 McCarty St., Indianapolis—The Standard Dry Kiln Co.

1922 --- OCTOBER - NOVEMBER - DECEMBER -- 1923

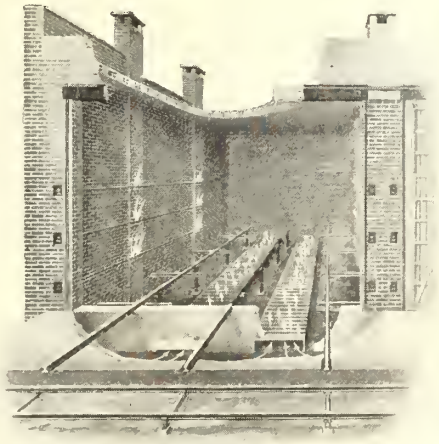
Three Months Until the New Year Arrives

Are you ready for a Bigger and a Better year's Production?

NATIONAL AUTOMATIC HUMIDITY CONTROLLED DRY KILNS installed NOW will assure you perfectly conditioned lumber. They are the fruit of over twenty years' experience in the designing, operating and manufacturing of lumber kilns by the best dry kiln engineers obtainable. Nationals owe their success to the constant research made by these engineers, and the executing of improvements to meet the new phases in the scientific application of their findings, as applied to the practical use of kilns. As a result NATIONALS have become the most perfect, practical drying apparatus on the market.

When installing a National you are not experimenting,—all experiments have been made at our expense. You are guaranteed absolute satisfaction in the production of cured lumber of the highest quality.

Business is daily growing in volume and all indications point to better conditions. Are your dry kilns adequate to handle a bigger and a better production during the coming year? If not, NOW is the time to bring them up to the desired standard. Whether it is a question of new kilns or the remodeling of the old, our engineering services are free. Kindly write us full details as to your problems and we will be pleased to respond. This will not obligate you in any way.



"The First Kiln in 6000 Years in which Humidity is Automatically Controlled"

The National Dry Kiln Company

1117 East Maryland Street Indianapolis, Indiana

C. A. FIELDS, Canadian Representative, P. O. Box 55, Toronto, Ontario

NATIONAL DRY KILNS

Alphabetical List of Advertisers—Continued

Laidalw Bale-Tie Co. 104
Larson & Shaw Ltd. 103
Litton Veneer Co. 81
Long-Knight Lumber Co. 93
Luehrmann Hardwood Lumber Co. Chas. F. 34

Marietta Paint & Color Co. 72
Mattison Machine Works 116
May Hardwood Co., R. R. 34
Mans, Chas. O. Lumber Co. 34
McDonagh Lumber Co. 39
McKenzie Machinery Co., D. 16
McKnight & Son Co., L. C. 14
Memphis Bandmill Co. 35
Memphis Veneer & Lumber Co. 83
Mercerean Hawkins Tie Co. 32
Merritt Engineering & Sales Co. .....
Mohawk Veneer Co. 83
Monite Glue 19
Morgan Machine Co. 113
Mowbray & Robinson 49
Murrelle Lumber Co., L. D. 41

Nash, J. M. 14
National Dry Kiln Co. 15
National Patent Reed Sales Co. 29
Nichols & Co., A. S. 77
Northwestern Cooperage & Lumber Co. .. 81

Oakey & Sons, John 103
Ober Manufacturing Co. 105
Ohio Veneer Company 81
Oliver Machinery Co. 114
Oriental Textiles Co. .....
Otis Mfg. Co. 30
Overton, S. E. 24

Pannill Door Co. 45
Pedwell Hardwood Lumber Co. 47
Penrod-Jurden Co. 84
Penrod Walnut & Veneer Co. 84
Perkins Glue Co. 17
Petrie Ltd., H. W. 111
Pettingell Machine Co. 97
Pickrel Veneer Co. 28
Porter Machinery Co., C. O. 104
Preston Woodworking Mach. Co. 10-11
Purcell Walnut Lumber Co., Frank 38

Radcliff Saw Mfg. Co. .....
Reese-Sheriff Lumber Co. 43
Richards Hardwood Co. 31
Richards-Wilcox Canadian Co. 97
Rush Lumber Co. .....

Shantz, P. E. 29
Shimer Cutter Head Co. 7
Shurley Dietrich Co. 7
Sidmans of Canada The 95
Simonds Canada Saw Co. 115
Sondheimer Co., E. 47
Standard Dry Kiln Co. 14
Standard Veneer Co. 83
Stark & Co., Jas. E. 39
Steels & Hibbard Lumber Co. 39
Stimson & Co., J. V. 40
Stimson Hardwood Co., J. V. 33
Stimson Veneer & Lumber Co. 33
Sturtevant Co., B. F. 101
St. Joseph Iron Works 113

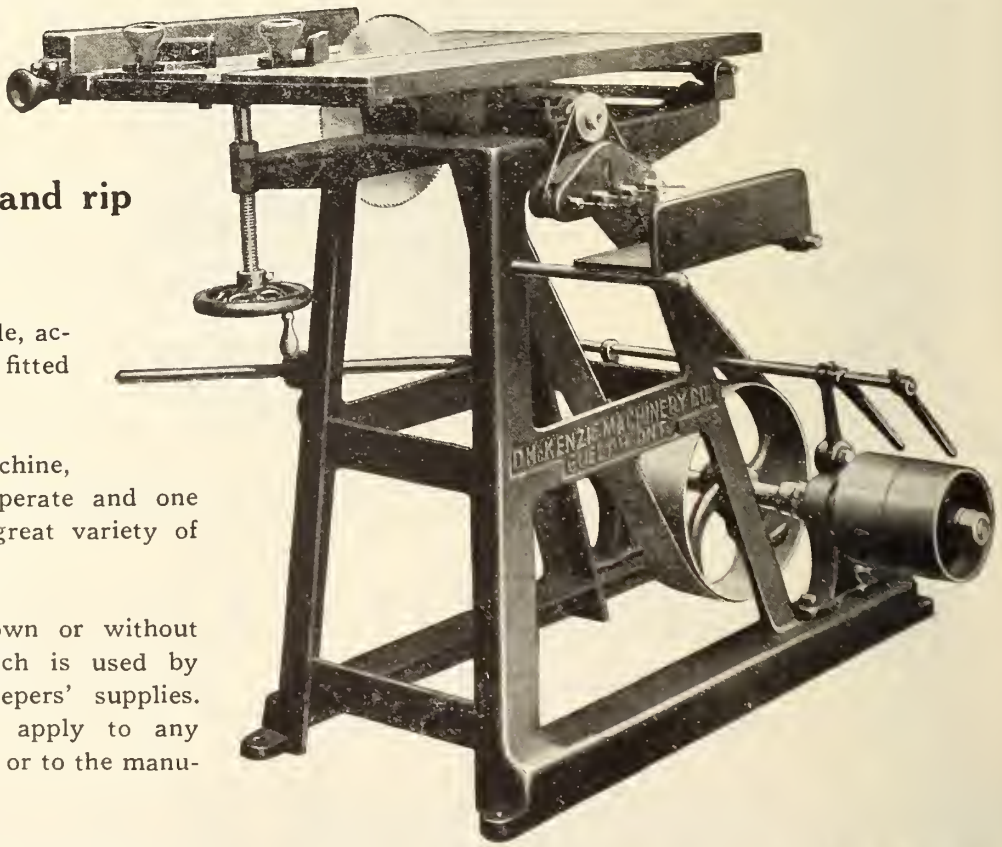
Taylor Mfg. Co., Jas. L. 111
Toronto Veneer Co. 91
Toronto Hardwod Lumber Co., Ltd. 91

Vandergrift & Morris 39
Veneer Manufacturing Co. 85

Waddell Mfg. Co. 24
Walter & Sons, J. 29
Watertown Table-Slide Co. 29
Willey Co., C. L. 89
Williams Machinery Co., A. R. 6
Williamson Veneer Co. 86
Wisconsin Veneer Co. 81
Wood Mosaic Co. 87
Wylie Mathew 6

Yates Machine Co., Ltd. P. B. 5-13
Yellow Poplar Lumber Co. 48
Young Lumber Co., Bedna 40

McKenzie



Cross-cut, mitre and rip Saw No. 2

All iron frame and table, accurately machined and fitted insuring good work.

A light inexpensive machine, handy and simple to operate and one which will turn out a great variety of work.

Sold complete as shown or without drilling attachment which is used by manufacturers of beekeepers' supplies. For further particulars apply to any reliable machinery dealer or to the manufacturers.

D. McKenzie Machinery Company, Guelph, Ont.

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

SATISFACTION

There is no keener satisfaction than that which comes from making a wise and careful purchase.

The worthy article bought becomes a grateful reminder of the soundness of the choice, and in service ever justifies the investment made.

Builders of plywood construction require a glue that is dependable in quality at all times and purchasers of Perkins Vegetable Glue have the keen satisfaction that comes from buying a uniform and dependable product.

Perkins Glue Company

Factory and General Offices
LANSDALE, PENNSYLVANIA

Sales Office
SOUTH BEND, INDIANA

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

Patents covering Perkins Glue have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.

WATCH FOR THE BULL DOG

UNIFORMITY

When used in describing a **Cannon Glue** is more than a claim. It is an established **fact!**

We have customers in Canada who have used one brand for fifteen to twenty years without one cause for complaint.

CANNON CANADIAN CO., LTD.
TORONTO MONTREAL

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY
17 State Street NEW YORK CITY

"Casco" for better product

YOUR confidence in your product is shared by your customer when he knows that

WATERPROOF GLUE

grips the Veneers or the joints.

Write for "CASCO" Red Book—a manual on Veneers, Panel-making and Glue. Samples of "CASCO" on request.

"CASCO" is Incredibly Strong Mixed in Cold Water Most Economical

Casco-made woodwork can be subjected to extreme variations in temperature and moisture without fear of separation.

The Casein Manufacturing Company
Largest and Longest Established Manufacturers of Casein Products in America
15 PARK ROW, - NEW YORK CITY

U. S. Navy uses MONITE —*the practical waterproof* GLUE

WHEN the U. S. Navy uses a glue by its brand name it certainly must be waterproof.

Not only has Monite Glue withstood the severe test of use by the U. S. Navy, but it has withstood many exacting laboratory test as well. Five-ply birch panels held with Monite have been soaked in the laboratory for ten whole days. The panels were boiled for twelve hours daily and cooled off each night. At the end of the test the glue joints were still unimpaired.

The absolute water resistance and the wood preserving qualities of Monite Glue greatly enhance the value of any glued articles. The fact that it may be mixed cold and in a remarkably short time, the greater spread and the quicker set—all save time and labor in the glue room and cut down your glue line cost.

Just what this amount is in dollars and cents can only be shown by one of our experts in your factory. Write us and we will arrange for such a demonstration without obligation on your part.

The Six Economies of Monite Glue:

1. Takes half as long to mix.
2. Gives a greater spread.
3. Sets more quickly.
4. Average shear strength 2641 pounds per sq. in.
5. Uniform quality varies less than 1% guaranteed.
6. Improves the product, gives longer life.

Monite Sticks To Its Job.

Monite Waterproof Glue Company

1628 North Second St. Minneapolis, Minn.

MONITE WATERPROOF GLUE

KANE VEGETABLE GLUE

We never cheapen the quality of our product in order to make low prices that cannot pay for first quality material and work.

Also

Kansine Waterproof Glue

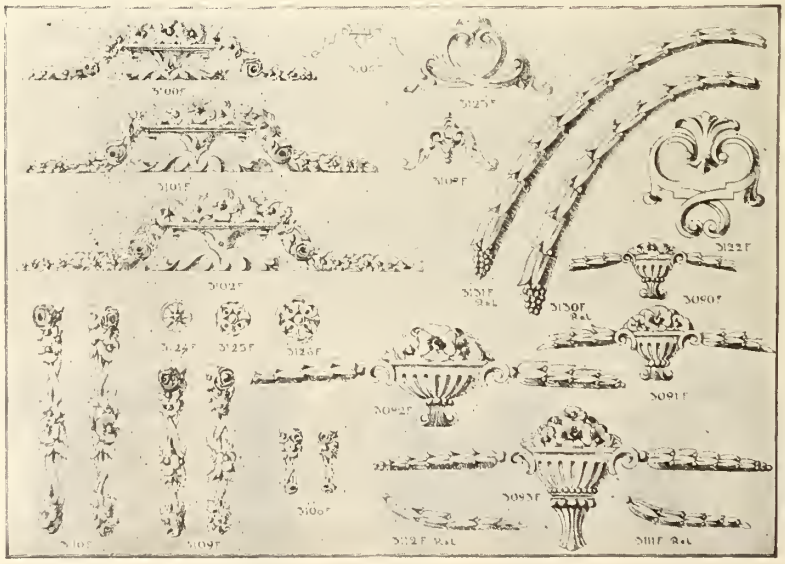
Manufactured exclusively by

KANE MANUFACTURING CO.

1832-34 South Clark Street CHICAGO, ILL.

PERIOD CARVINGS *for* FURNITURE

Largest Manufacturers of Imitation Wood Carvings in the World Quality the Best. Prompt Shipments



Unlimited Facilities for Manufacturing High Grade Wood Carvings in Composition and Wood Fibre

Reproductions of Exclusive Designs Our Specialty

THE DECORATORS SUPPLY CO.

2543 ARCHER AVENUE, CHICAGO

New Catalog Sent on Request

A Better FINISH

You can improve the appearance and durability of your finishes and increase the saleability of your furniture by using

Cosmos High Grade Lacquers and Lacquer Enamels

Lacquer gives a permanent, waterproof surface that is tough and durable.

It dries rapidly, increasing the output of the finishing department. Successive coats may be applied at half-hour intervals, enabling work to be finished in one day.

Samples, prices and other particulars gladly furnished.

Our Specialties:

METAL LACQUERS
WOOD LACQUERS
ENAMELS
BRONZING LIQUIDS
EUREKA AIR BRUSHES
AMYL-ACETATE
REFINED FUSEL OIL
COLLODION
BRONZE POWDERS
MATCHLESS METAL POLISHES AND BUFFING COMPOSITIONS
BANANA OIL

Cosmos Chemical Company
Port Hope Ontario

The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5,000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

Dominion Appraisal Company Limited

The Test of An Appraisal

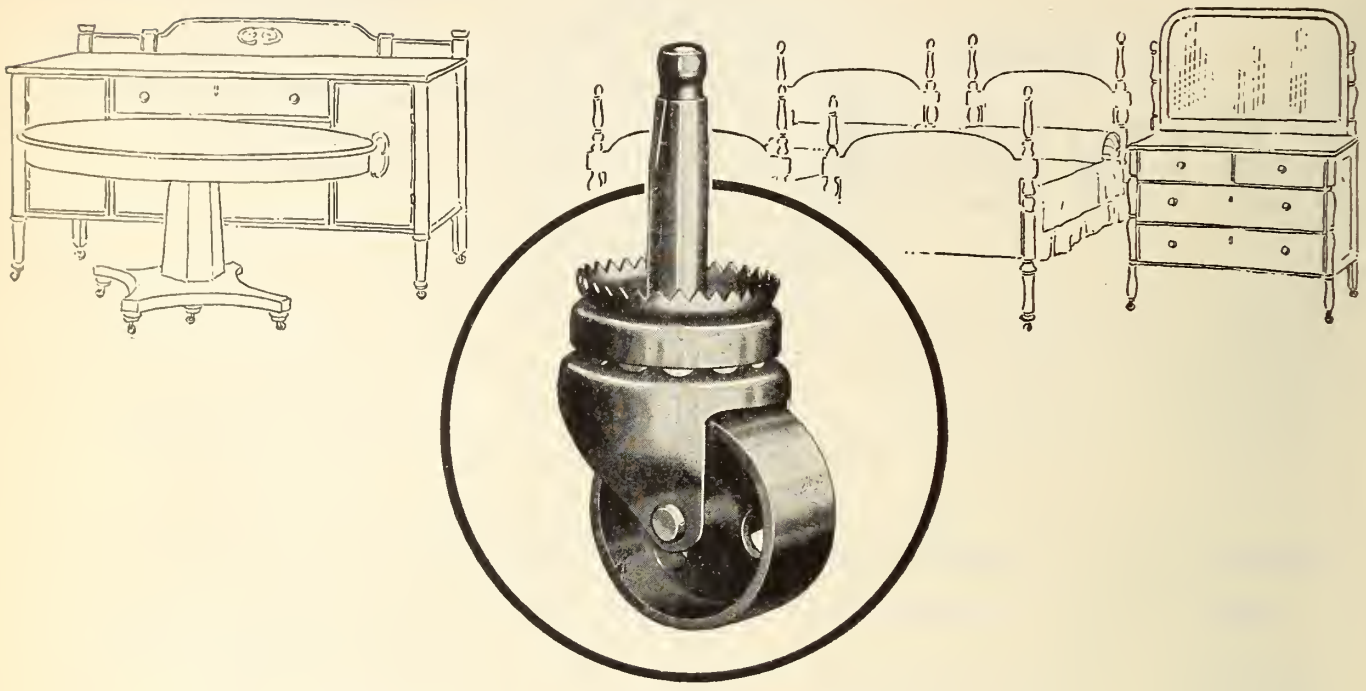
"We have never been so grateful for anything we have done as for the appraisal made by you in December 1919. It certainly was worth thousands of dollars to us in the adjustment of the fire."

Port Arthur Daily News Limited
May 5th, 1921

Our staff of qualified appraisers—men with many years experience in the appraisal field—and our system of careful supervision of all work entrusted to our care has afforded protection to our large clientel extending throughout the Dominion of Canada.

We solicit your correspondence

8-10 Wellington Street East
TORONTO, ONT.
Telephone Main 646.



Perfection and Satisfaction

They travel remarkably close together.

The fine old four-poster that can be pushed over the floor so easily gives the owner a thrill of pride.

The good casters like the reliable Efemco have a big part in that.

And they will always roll just as smoothly. They do it right through a lifetime.

It's so easy to make sure that good furniture is equipped with Efemco Casters.

Send today for the **Efemco** *Caster catalog.*

Acme Grip Neck and Plate Casters
Acme Roller Bearing Casters
Atlas Plate Roller Bearing Casters

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters

Roller Bearing Casters
Truck Casters
Automobile Accessories

Piston Rings
Grey Iron Castings

Standardized by 57 years of service.

Two Definitions—Which Is Most Practical

FOR YOU TO USE?

Compo or Composition Carvings:—A puddy like compound made up of whitening, glue and rosin, is **not** immune to atmospheric conditions. Is **not** fiberous in nature. Has little or no grain. Is **not** sharp in detail. Can **not** be guaranteed against chipping. It is **not** immune to cracks due to expansion and contraction. Does **not** stain like **wood**. Should **not** be found on good furniture.

Keep up the spirit of the times, properly decorated furniture will always be in vogue. Do not kill Period Furniture by decorating the same with unreliable carvings.

"Fibro" Wood Carvings:—A reliable wood product. The result of years of diligent effort. Inspired entirely because of the short-comings of puddy carvings. Having all the grain effects of wood, sharp in detail, and truly artistic, all the qualities for absorbing stain and taking on a wood like finish. Last but not least a Canadian product.

Make Canada prosperous by buying Canadian products

JOHN WALTERS & SONS LIMITED

KITCHENER :-: ONTARIO

Overton Fine Benches

OUR peculiar construction makes every Bench permanently durable. Careful workmanship, dignified designs and a beautiful finish. We can exactly match any standard instrument.

We also specialize in large quantity production of Bench parts, phonograph legs and parts, table and floor lamps, and fine turnings and carvings of every description.

Our fine organization of skilled workmen assures high quality at the lowest prices.

Your own designs promptly and faithfully reproduced. Consult us.

The No. 45 Duplex Duet Width

S. E. OVERTON COMPANY

South Haven, MICH. U.S.A.

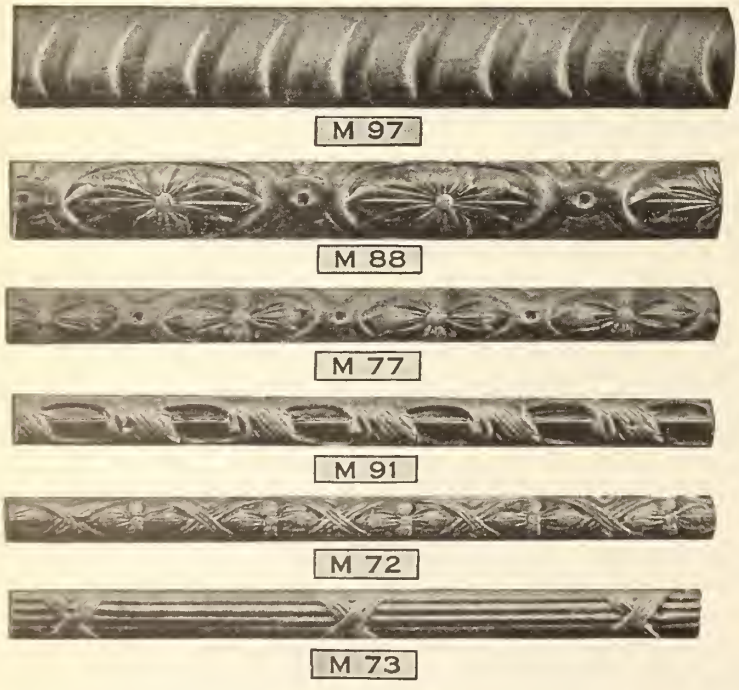
CARVED MOULDINGS, CARVINGS, CARVED LEGS

No. D-775 (Reduced One-Half)

No. D-763 (Reduced One-Half)

"KLISE' mouldings are carved, not pressed. Made in several hundred classic, period designs, in various sizes and shapes. Catalogue of legs and samples of mouldings sent on request. Send us your designs or samples of carvings for quotation.

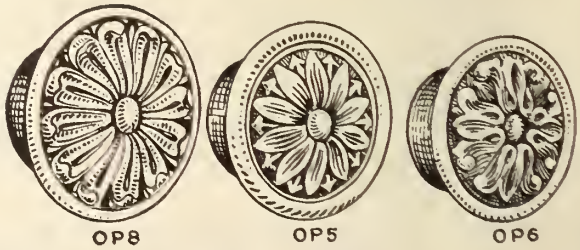
KLISE MANUFACTURING COMPANY
Grand Rapids, Michigan



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

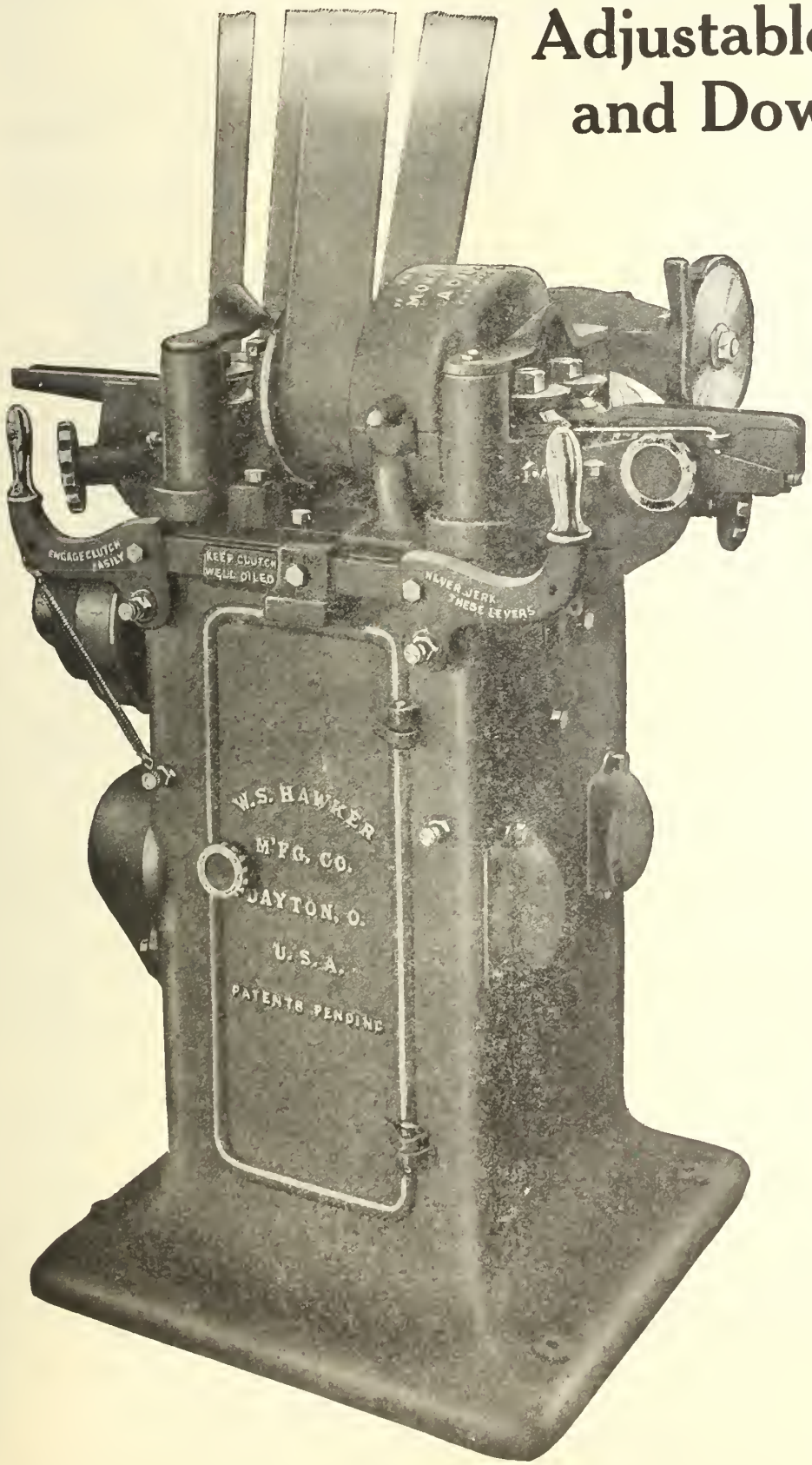
ROSETTES A new Period item to accompany the knobs.



Waddell Manufacturing Company

Coldbrook and Taylor, N. W. **Grand Rapids, Mich.**

The Money Maker— Adjustable Rod and Dowel Machine



Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

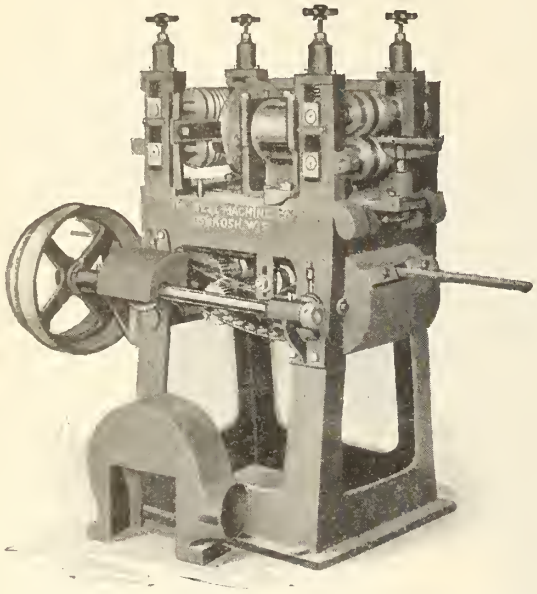
The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely
Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio

Make Your Own Dowels With the "BELL" Machines

The Fastest and Most Practical Equipment For the Purpose



Adjustable Rod and Dowel Machine

The fastest dowel machine in the world.

Constructed to withstand the heavy and constant strain to which this type of machine is subjected.

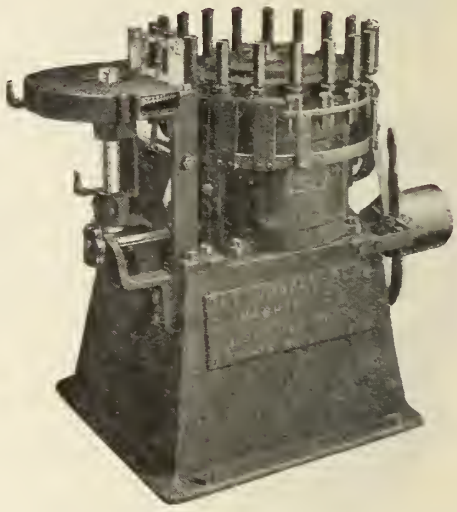
Equipped with a universal four-knife cutter head adjustable to turn rods of all diameters from ¼" to 2" in either plain, spiral groove, longitudinal groove, or imitation reed wind. Special machine for turning rods of larger size.

Cutter-head mandrel is mounted at each end in ball-bearings of the highest grade.

Out-going feed rolls have combination of grooves so that many sizes can be made without changing feed rolls. The in-going feed rolls are adjustable for all sizes of squares.

Will work stock as short as 4½ inches.

Furnished with countershaft or motor drive.



Dowel Cutting Off and Pointing Machine

This machine is for cutting off and pointing dowel pins from long rods.

It will cut and point dowel pins of all diameters up to ¾", and in any length up to 6 inches.

Capacity of this machine is from 300 to 400 pins a minute. Any boy can operate it.

All working parts are completely enclosed and thus protected from dust and dirt.

Absolutely no danger to operator.

The floor space required by this machine is only 22" x 36".

Tight and loose pulleys on machine.

Furnished with belt or motor drive.

MANUFACTURED BY

The Bell Machine Company

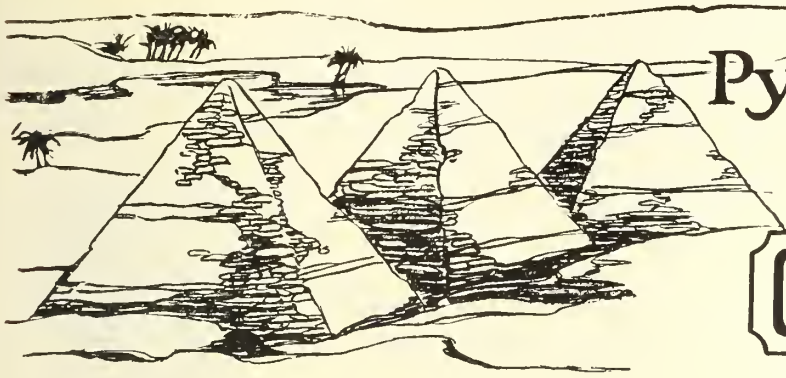
(Successors to the Dauber-Bell Machine Co.)

Oshkosh, Wisconsin, U.S.A.

Representatives:

For Great Britain: THE OLIVER MACHINERY CO., 201 Deansgate, Manchester, England

For Canada: THE A. R. WILLIAMS MACHINERY CO. LTD., Montreal, Toronto, Winnipeg



Pyramids of Sand vs. OPENKOTE

Garnet Finishing Paper

THE surfaces of ordinary finishing papers are in reality uneven series of isolated *pyramids* or peaks of "sand"—kernels indiscriminately piled on top of one another. The high peaks are the cause of scratching in finishing work. Contrary to the usual impression they do not improve the cutting power of the paper, but shorten its life.

Magnified section of ordinary finishing paper

THE lower layer of kernels (*the real cutting surface*) in the above type of papers cannot start to work until the isolated pyramids of super-imposed kernels are worn down. During this process the danger of scratching is always imminent.

Magnified section of Behr's OPENKOTE Garnet Finishing

In OPENKOTE Garnet Finishing no kernels are interfered with, blocked, or covered by others. *Every grain is on the same perfect level,* cutting uniformly, with the same pressure, *and all at the same time.*

The abrasive surface of OPENKOTE Garnet Finishing is smooth and even, yet open, and constantly presents maximum roughness to the work. This is why OPENKOTE lasts longer and cuts faster and cleaner than ordinary finishing papers. It will not slide or scratch.

Behr's OPENKOTE Garnet Finishing is scientifically coated by a process exclusively our own. Its many technical superiorities, not visible to the naked eye, enable the artisans who use Behr Products to attain the finest finishes possible—smooth, even, and scratchless.

Send for samples of Behr's OPENKOTE Garnet Finishing for comparative tests on your own work. A post card specifying grades desired will bring them, without charge.

HERMAN BEHR & CO., Inc., 31-63 Tiffany Place, Brooklyn, New York City

Chicago San Francisco St. Louis Montreal Toronto Grand Rapids Boston

1872 — *Pioneers in the Improvement of Sandpapers for Fifty Years* — 1922

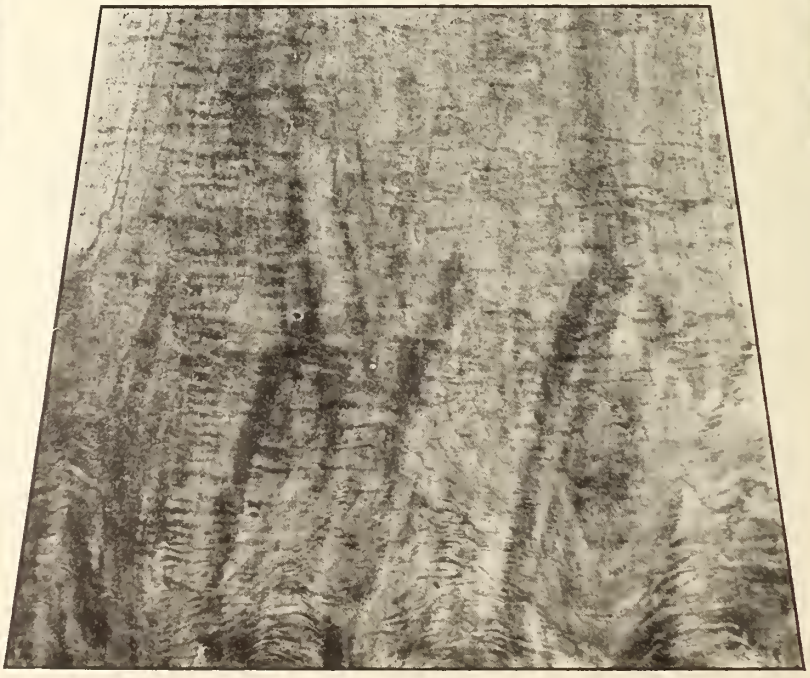
INVENTORS AND SOLE MANUFACTURERS OF OPENKOTE SANDPAPERS. LOOK FOR THIS TRADE MARK

Walnut?—Yes,—Good Walnut?—Yes!
Pickrel

Walnut's sheer beauty, strength, uniformity and permanence brought it in a few years to unquestioned supremacy in furniture construction. Dominance in furniture proves but the beginning. This surpassing merit is every day compelling increased use in new cabinet fields. Pickrel walnut veneers fill an important place in this wider development. A limitless selection of quality veneer logs, careful and skilled manufacture and a constant stock of five million to seven million feet of nicely assorted woods have given Pickrel walnut veneers a special significance. Buyers will appreciate the responsible, conscientious and experienced representation through which Pickrel veneers are offered at their respective plants. It assures the closest possible conformity to the individual requirements of each—meaning less cost in working and a better product.

PICKREL VENEER CO.

New Albany, Indiana



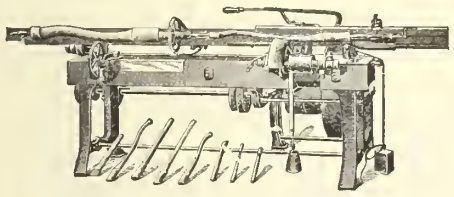
Are You Using
Roller-Bearing Equalizer Table Slides?

These are the most smoothly operating slides on the market. Give absolutely no trouble at all. Let us send you prices and full particulars.

WATERTOWN TABLE - SLIDE COMPANY
Watertown, Wisconsin, U.S.A.

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.
We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY
Klotz Machine Co.,
Sandusky, O., U. S. A.
Write for descriptive circulars and prices.

FIBRO-KANE
PATENTED
OPEN WEBBING

NATIONAL PATENT REED SALES COMPANY
DREXEL BUILDING
PHILADELPHIA, PA.

FACTORY TRUCKS

Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY
P. E. SHANTZ, PRESTON, ONTARIO.

Factory Truck Style No. 26.

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

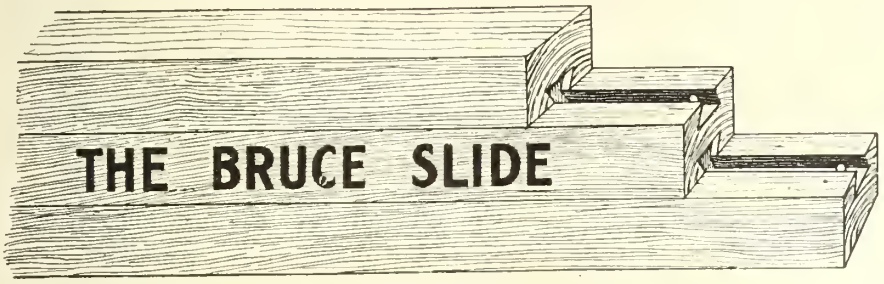
Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

TABLE SLIDES TABLE RIMS TABLE PINS



Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

H. J. RICHARDS J. T. KENDALL

Richards Hardwood Company

746-7 BANK OF COMMERCE BUILDING

Memphis, Tennessee, U. S. A.

Successors to Dacus-Richards Hardwood Co.

We make a specialty of catering to the Canadian trade and are in position to make reasonably prompt shipment of practically any Southern Hardwoods which you are needing. Your orders and inquiries will be highly appreciated and will receive our prompt and personal attention.

Specializing in Delta Red and Sapgum, Oak, Elm and Poplar.

GENERAL HARDWOOD LUMBER COMPANY

SOUTHERN AND NORTHERN HARDWOODS

118 North La Salle Street

CHICAGO

Quick shipments assured, together with quality stocks.

Kindly favor us with your enquiries.

Mercereau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

CANADIAN·NASHUA·PAPER·CO·LTD
SERVICE PRODUCTION QUALITY
TRADE MARK
PETERBOROUGH ONT

Buy Nashua Veneer Tapes

(Paper and Cloth)

QUALITY SUPREME

SERVICE UNEQUALLED

THE CANADIAN NASHUA PAPER CO., Ltd.

Peterborough, Ont.

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK

3	cars	4/4″	Fas.
5	"	4/4″	No. 1 Common.
1	"	4/4″	No. 2 Common.

PLAIN WHITE OAK

2	cars	4/4″	Fas.
2	"	5/4″	No. 1 Com. & Btr.
3	"	4/4″	No. 1 Com. & Sel.
3	"	4/4″	No. 2 Common.

QUARTERED RED OAK

3	cars	4/4″	Fas.
6	"	4/4″	No. 1 Common.
2	"	4/4″	No. 2 Common.

PLAIN RED OAK

2	cars	4/4″	Fas.
3	"	5/4″	Fas.
3	"	6/4″	Fas.
2	"	8/4″	Fas.
8	"	4/4″	No. 1 Common.
2	"	5/4″	No. 1 Common.
2	"	6/4″	No. 1 Common.

QUARTERED RED GUM

2	cars	4/4″	Fas.
2	"	4/4″	Fas. Fig.
2	"	5/4″	Fas.
2	"	6/4″	Fas.
10	"	4/4″	No. 1 Common.
2	"	5/4″	No. 1 Common.
2	"	6/4″	No. 1 Common.

QUARTERED RED GUM S.N.D.

5	cars	5/4″	No. 1 Com. & Btr.
5	"	6/4″	No. 1 Com. & Btr.
10	"	8/4″	No. 1 Com. & Btr.

ASH

4	cars	10/4″	No 1 Com. & Btr.
2	"	12/4″	No. 1 Com. & Btr.
1	"	6/4″	No. 1 Com. & Btr.
2	"	4/4″	No. 1 Common.
2	"	4/4″	No. 2 Common.
2	"	5/4″	No. 1 Com. & Btr.

SAP GUM

8	cars	4/4″	Fas.
3	"	5/4″	Fas.
3	"	6/4″	Fas.
15	"	4/4″	No. 1 Common.
8	"	4/4″	No. 2 Common.
5	"	5/4″	No. 1 Common.
5	"	6/4″	No. 1 Common.

COTTONWOOD

2	cars	4/4″	Fas.
6	"	4/4″	No. 1 Common.
3	"	4/4″	No. 2 Common.

ELM

2	cars	4/4″	Log Run.
2	"	5/4″	Log Run.
1	"	8/4″	Log Run.
6	"	10/4″	Log Run.
6	"	12/4″	Log Run.

Charles O. Maus Lumber Co.

South Bend, Ind., U.S.A.

Southern & Northern Hardwood Lumber

Red Gum (plain or quartered)
Sap Gum (plain or quartered)
Oak (plain or quarter cut)
Ash
Maple
Basswood
Southern Elm
Cottonwood
Cypress
Tupelo
Oak Timbers
Birch
Beech

If you want dry stocks and honest grades, we have them.

High Grades Service

Why not give us a trial?

La Tuque Turpentine

Made by an improved laboratory process from Canadian woods.

An excellent thinner for paste, colors, enamels, stains, paints and varnishes.

La Tuque Turpentine contains no free rosin.

The quality is there
The price is right

Write us for particulars

BROWN CORPORATION
56 St. Peter St., QUEBEC, P.Q.

In July We Sold

25 cars of Lumber

in Canada Alone

There is a Reason

(with apologies to Postum)

They Satisfy

(with apologies to Chesterfields)

We want to move quickly:

4/4 and 8/4 No. 1 Com. Quartered Red Gum
4/4 No. 1 Common Quartered White Oak
4/4 No. 2A Common Poplar
4/4 No. 1 Common Poplar
6/4 No. 1 Common Walnut
8/4 No. 1 Common Walnut

Satisfactory Service

R. R. May Hardwood Co.

1522 S. Sixth St Louisville, K.Y.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Ply Wood Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Southern Hardwoods

GUM
POPLAR
and OAK

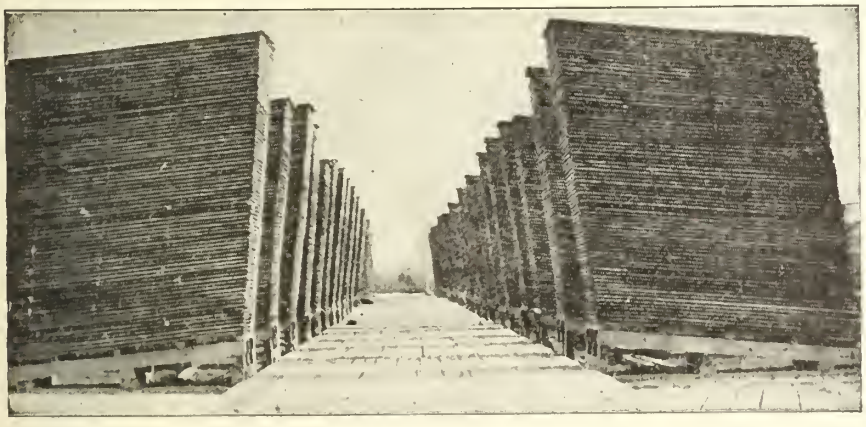
The fact that most manufacturers who try our products for the first time eventually become regular customers, should be an indication of the satisfaction you may expect to receive in a trial order. May we be permitted to demonstrate our qualifications for handling your business.

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY Memphis - Tennessee SERVICE

Efficiency Marks Every Step of Our Service to You



Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

IN THESE DAYS of competitive markets even a slight difference in the quality of the lumber that goes into your product often turns the sale in your favor.

Many of the best furniture makers in the country frankly concede that IOWA WALNUT is distinctly better on the average in texture and marking than ordinary walnuts. Let us quote you on this better walnut—lumber and veneers.

IOWA
Walnut
Grown on
Iowa
Corn Land

Des Moines Sawmill Company
1024 Murphy Street
Des Moines, Iowa

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

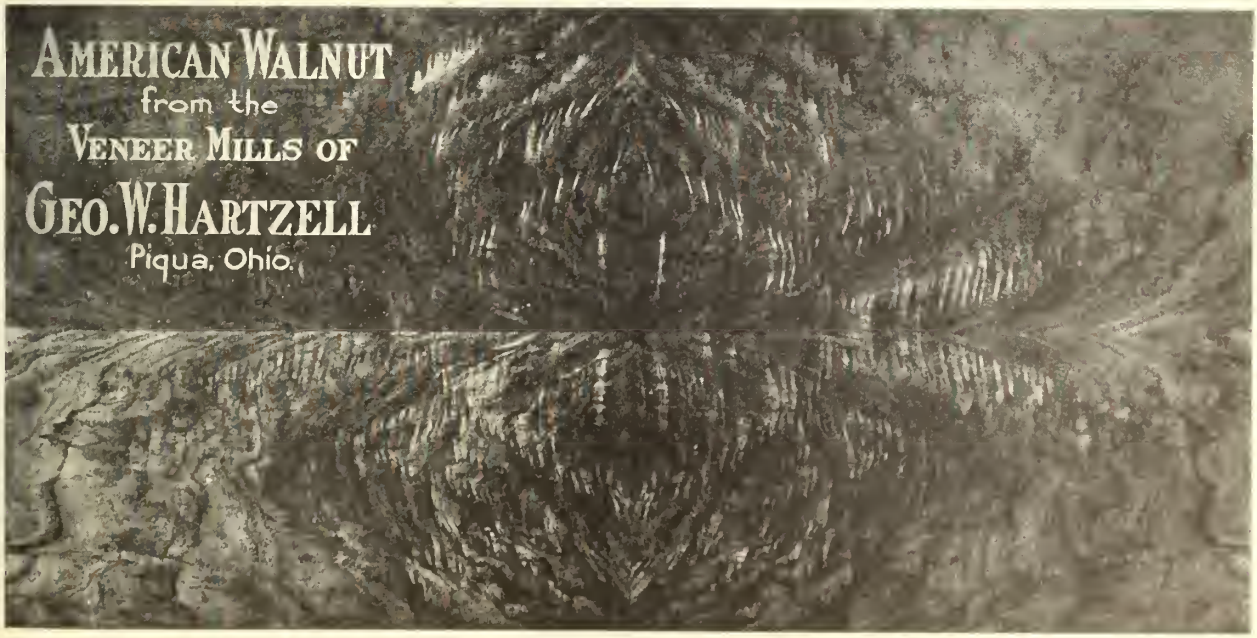
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

Air Dried or Kiln Dried?

Kiln dried stock will mean an advantage to you—a material reduction in weight with a resulting reduction in freight cost. Kiln-drying in our plants means the latest and most improved methods together with efficient handling.

Any of the following items in Southern Hardwoods can be shipped promptly from our band mill at Little Rock, Arkansas. Band sawn in our own mill, dry, good widths and excellent lengths, this stock graded according to National Hardwood Lumber Association rules represents a good value for you.

QUARTERED RED GUM

3	cars	5/4" FAS
1	"	8/4" FAS
1	"	12/4" FAS
3	"	5/4" No. 1 Com. & Sel.
6	"	6/4" No. 1 Com. & Sel.
2	"	8/4" No. 1 Com. & Sel.
½	"	10/4" No. 1 Com. & Sel.

QUARTERED SAP GUM

4	cars	5/4" FAS
1	"	8/4" FAS

QUARTERED WHITE OAK

1	car	4/4 x 10 & wider FAS
1	"	5/4" FAS

QUARTERED FIGURED RED GUM

2	cars	4/4" No. 1 Com. & Sel.

PLAIN RED GUM

½	car	6/4" No. 1 Com. & Sel.

WEIGHTS PER THOUSAND FEET

	Air Dried	Kiln Dried
Oak	4400	4000
Red Gum	3500	3200
Sap Gum	3300	3000

If you do not see just what you want in this list, write us giving your requirements. Our mill is now cutting excellent quality Southern Hardwoods.

E. L. BRUCE COMPANY

MANUFACTURERS

MEMPHIS, TENN.

Band Mill: Little Rock

Oak Flooring Plants: Memphis; Little Rock

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment

All grades and thicknesses

Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good. Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

Steele & Hibbard Lumber Co.
ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

Do You Use Dowel Screws?
Do You Use Hanger Bolts?
Do You Use Wing Nuts Separately?

Buy direct from us and save the jobber's profit.

VANDEGRIFT & MORRIS
Shelbyville, Ind.

McDonagh Lumber Co.
203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods
Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

BUSINESS GETTERS

Bedna Young's
Southern Hardwoods

HERE are hardwoods that assist the craftsman in his endeavour to produce the most attractive furniture; that help you to sell the dealer; that help the dealer to sell the consumer Your choice of lumber does affect sales—it can effect them in the right direction when you choose Bedna Young's Southern Hardwoods.

We make a specialty of fine figured quartered oak.

Bedna Young Lumber Co.
Jackson, Tennessee

HARDWOOD LUMBER

"A Quality you will admire"

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Kiln Dried Products

Our kiln at Owensboro is a thoroughly modern equipment for handling green or dry lumber with efficiency and entire satisfaction.

Our facilities enable us to give real service—straight or mixed carloads.

Try our soft textured and finely figured quartered-sawn red and white oak. It will please you.

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills Owensboro; Campbellsville, Kentucky

DIMENSION

On hand for immediate shipment

1 car clear Red Gum 2½ x 2½-30"
2 cars " Sap Gum 2½ x 2½-30"
1 car " Sap Gum 2 x 2 and 2½ x 2½-60"
1 car " Sap Gum 2 x 2 and 2½ x 2½-18"
2 cars " Sap Gum 2 x 2 -30"
2 cars " Oak, 2 x 2 -30"
2 cars " Oak, 2 x 2 -19"
1 car " Ash 1-¾ x 1-¾ and 2 x 2-30,44 & 50"

All dry stock.

"We can furnish your requirements in OAK and HICKORY WAGON STOCK and BENDING MATERIAL; also clear FURNITURE DIMENSION in squares or flat stock. Write us for prices."

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office Dimension Mill & Yard
Belt Line at McLean.
MEMPHIS - TENN.

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated

General Office, NEW ORLEANS, U.S.A

AMERICAN BLACK WALNUT

LUMBER **VENEERS**

OUR SPECIALTY

We are prepared to furnish straight or mixed cars, all grades 3/8" to 4" in thickness.

BAND MILL IN DAILY OPERATION

Various items in Quartered White and Red Oak and Cherry.

1/28". SLICED. WALNUT VENEER especially selected for quality wood and color.

The Kosse, Shoe and Schleyer Co.

Lock Box No. 18 St. Bernard, Cincinnati, Ohio.

Agents in all Furniture Centres.
Offices: Jamestown, N. Y. and Grand Rapids, Mich.
Represented in Chicago, Rockford, Ill., Detroit, Kitchener, Ont., Canada, New York City and San Francisco.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

A few Specials :

130,000 ft. 4/4" No. 1 and No. 2 Common Qtrd. White Oak
65,000 ft. 4/4" No. 1 and No. 2 Common Plain White Oak
100,000 ft. 4/4" No. 1 and No. 2 Common Poplar

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Buffalo Hardwood Lumber Co. J. B. Wall, Pres't M. M. Wall, Treas. T. H. Wall, V-Pres't.
940 Seneca Street
We specialize in—WHITE ASH, OAK AND MAPLE
We handle a complete stock of Quartered Oak, Poplar, Red Cedar.

BUFFALO *"Buy and Sell Hardwoods in this Market."*
FAMOUS LUMBER CENTER
Unequalled facilities for rapid dispatch, by Rail, Lake or Barge Canal, on all your requirements, large or small.
SUPPLYING THE HARDWOOD NEEDS OF THE NATION

ATLANTIC LUMBER COMPANY
HARDWOODS
Our Specialty—West Virginia and Pennsylvania Cherry
West Virginia Soft Red and White Oak. 1055 Seneca Street

BLAKESLEE, PERRIN & DARLING
A complete stock of seasoned Hardwoods
Including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

T. SULLIVAN & COMPANY
NORTHERN
Gray Elm and Brown Ash
Niagara Street Corner Arthur

YEAGER LUMBER CO., INC.
Our Specialities
Oak Poplar Ash Maple
932 Elk Street

1" to 4 No. 1" Common and 1s & 2s **HARD MAPLE**
Excellent widths and lengths.
Can kiln dry and surface.
G. Elias & Bro., Inc. Elk Street to the Buffalo River **Buffalo, N. Y.**

STANDARD HARDWOOD LUMBER CO.
Hardwoods
Prompt Shipments—from Buffalo Yards or from Mill direct to you
8,000,000 feet Dry Stock on Hand. 1333 Clinton Street

MILLER, STURM & MILLER
Hardwoods of All Kinds
1142 Seneca Street

HUGH McLEAN LUMBER CO.
HARDWOODS OF ALL KINDS
Our Specialties—Quartered White Oak, Plain and Quartered Gum
940 Elk Street

Taylor & Crate Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 ft. of Hardwoods carried at all times at our big Buffalo yards.
RAIL AND CARGO SHIPMENTS
Established 56 Years 2101 Elmwood Avenue

FRANK T. SULLIVAN
Specialties
Cherry, Walnut and Pacific Coast Woods
Main Office: 600 Ellicott Square. Yard: 2598 Delaware Ave.

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods
White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES - that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

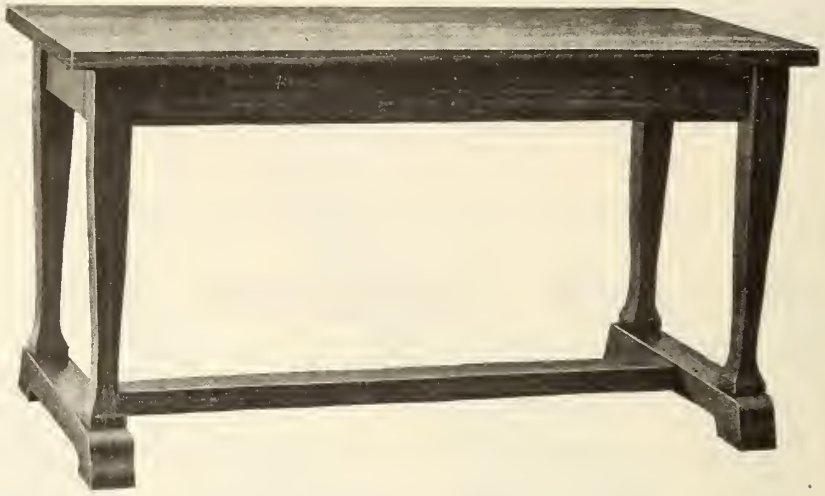
The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.
BAY CITY - - MICHIGAN



This handsome piano bench is made of

Canadian E C & S *Birch*

THERE is a firm in South Acton, Mass., U.S.A. who specializes in the manufacture of Piano Stools and Benches.

It is significant that this firm with a wide reputation for the quality of its products should be large users of Canadian Birch as supplied by Edward Clark & Sons Limited. It speaks well for this versatile Canadian wood with its close even texture and beautiful grain—adaptable to the most artistic and yet practical uses.

Another big factor contributing to its popularity is its economy. For while Birch closely resembles Mahogany and has indeed many of the good qualities of that wood, it is much less expensive.

Try a carload. We know you will be more than pleased with your purchase.

Edward Clark & Sons Limited

807 Bank of Hamilton Building Toronto, Canada

EFFICIENCY *COURTESY* *SERVICE*

SELECTED **RED GUM** BEAUTIFUL FIGURE

DOORS

No. 402 Inside Doors

Now Actually

IN STOCK

In the following sizes
1¾" thick only.

No. 402	No. 491
2 - 0 x 6 - 8	2 - 0 x 6 - 8
2 - 2 x 6 - 8	2 - 2 x 6 - 8
2 - 4 x 6 - 8	2 - 4 x 6 - 8
2 - 6 x 6 - 8	2 - 6 x 6 - 8
2 - 8 x 6 - 8	2 - 8 x 6 - 8
2 - 6 x 6 - 10	2 - 10 x 6 - 10
2 - 8 x 6 - 10	
2 - 10 x 6 - 10	

We also have a few beautiful inlaid gum slab front doors

No. 491 French Doors

Selected Red Gum as a wood for doors and finish is, be cause of its beautiful grain, becoming so popular that we decided to keep them in stock in ad dition to our already large stocks of
BIRCH, OAK, CHESTNUT, FIR, PINE and REDWOOD.

—YOU CAN NOW GET THEM QUICKLY—

We Have About 15,000 Doors in Stock

THIS MEANS SERVICE

Send us your next order we will save you money

PANNILL DOOR CO., LIMITED

131 Front Street East

Main 659 **Toronto, Canada** **Main 623**

WOOD
TURNINGS

Let us quote you on
your requirements
for handles and small
wood turnings

J.H. Connor & Son
Limited
Ottawa Ont.

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co.
LIMITED
Orillia, Ontario
Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

Ash Poplar Cypress

HAFNER

MANUFACTURING COMPANY

We can Ship promptly from St. Louis practically all items of Oak, Poplar, Gum, Cypress.

ST. LOUIS, MO., U.S.A.

ESTABLISHED 1871

Oak Red Gum

If--

it is Canadian Hardwoods we have it.

Still some 1921 stock available.

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVENUE - - - TORONTO

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.	5/8	1s & 2s
50M ft.	5/8	No. 1 Com.
75M ft.	3/4	No. 1 Com.
50M ft.	4/4	1s & 2s
50M ft.	4/4	No. 1 Com.
50M ft.	5/4	1s & 2s
100M ft.	5/4	No. 1 Com.

QUARTERED RED GUM

25M ft.	4/4	1s & 2s
100M ft.	4/4	No. 1 Com.
35M ft.	5/4	1s & 2s
50M ft.	5/4	No. 1 Com.
35M ft.	6/4	1s & 2s
50M ft.	6/4	No. 1 Com.
60M ft.	8/4	1s & 2s
60M ft.	8/4	No. 1 Com.
40M ft.	10 & 12/4	No. 1 C&B

QUARTERED SAP GUM

25M ft.	5/4	No. 1 Com.
25M ft.	6/4	FAS
100M ft.	8/4	No. 1 C&B
19M ft.	10/4	No. 1 Com.

PLAIN SAP GUM

100M ft.	5/8	1s & 2s
100M ft.	5/8	No. 1 Com.
50M ft.	3/4	1s & 2s
50M ft.	3/4	No. 1 Com.
100M ft.	4/4	1s & 2s
100M ft.	4/4	No. 1 Com.
100M ft.	5/4	1s & 2s
100M ft.	5/4	No. 1 Com.

PLAIN WHITE OAK

25M ft.	3/4	1s & 2s
50M ft.	3/4	No. 1 Com.
25M ft.	4/4	1s & 2s
25M ft.	4/4	No. 1 Com.

PLAIN RED OAK

100M ft.	3/4	1s & 2s
100M ft.	3/4	No. 1 Com.
100M ft.	4/4	1s & 2s
100M ft.	4/4	No. 1 Com.
25M ft.	8/4	No. 1 C&B

QUARTERED RED OAK

50M ft.	4/4	No. 1 Com.

QUARTERED WHITE OAK

50M ft.	4/4	No. 1 Com.

COTTONWOOD

100M ft.	4/4	1s & 2s
100M ft.	4/4	No. 1 Com.
50M ft.	5/4	1s & 2s
50M ft.	5/4	No. 1 Com.
100M ft.	6/4	1s & 2s
25M ft.	6/4	No. 1 Com.

QUARTERED TUPELO

50M ft.	4/4	No. 1 C&B

PLAIN TUPELO

50M ft.	5/8	No. 1 C&B
50M ft.	3/4	No. 1 C&B
100M ft.	4/4	1s & 2s
100M ft.	4/4	No. 1 Com.
50M ft.	5/4	1s & 2s
50M ft.	5/4	No. 1 Com.
50M ft.	6/4	1s & 2s
50M ft.	6/4	No. 1 Com.

WILLOW

100M ft.	4/4	1s & 2s
200M ft.	4/4	No. 1 Com.
100M ft.	5/4	1s & 2s
100M ft.	5/4	No. 1 Com.
75M ft.	6/4	1s & 2s
15M ft.	6/4	No. 1 Com.
15M ft.	8/4	1s & 2s
50M ft.	8/4	No. 1 Com

Band-mills at Baton Rouge, La. Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

Mills: Coal Grove, Ohio

General Offices: 33 Rector St. New York City

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.	48,000
1¼ in.	2,500

CHERRY

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	31,500	2,200	83,900	104,000
1¼ in.	24,500	200	43,600	25,500
1½ in.	22,200	.....	39,700	66,300
2 in.	21,000	.....	26,200	63,900
2½ in.	5,500	.....	4,300	2,200
3 in.	22,700	.....	6,500	5,300
4 in.	4,900	.....	900	400

CHESTNUT

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,500	.....	54,000	34,000
1 in.	82,000	3,500	61,000	51,000
1¼ in.	26,800	100	44,200	140,200
1½ in.	29,500	1,600	52,000	29,200
2 in.	22,200	.....	25,300	25,200
2½ in.	4,000	.....	1,000	700
3 in.	.....	.....	300	500
1 in.	1,500	.....	300	.....

PLAIN RED OAK

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
¾ in.	163,000	279,000	39,800	11,500
⅝ in.	.....	74,000	42,600	2,000
1 in.	119,200	30,000	9,400	106,000
1¼ in.	31,700	14,600	300	1,100
1½ in.	60,900	30,200	4,000	.....
2 in.	68,500	100,000	47,000	5,000
2¼ in.	1,500	1,400	.....	.....
2½ in.	94,100	33,000	.....	.....
3 in.	20,800	20,500	7,000	12,000
4 in.	2,600	4,900	.....	.....

PLAIN WHITE OAK

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
⅝ in.	2,150	3,000	16,900	3,000
¾ in.	235,800	379,000	80,000	38,000
1 in.	54,300	94,000	18,200	183,000
1¼ in.	5,700	.....	.....	.....
1½ in.	51,300	71,000	700	.....
2 in.	35,000	79,000	12,000	7,500
2½ in.	121,800	47,500	2,000	1,800
3 in.	12,800	43,800	2,400	600
3½ in.	4,500	5,000	.....	.....
4 in.	26,000	20,500	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
½ in.	6,100	.....	.....	.....
⅝ in.	2,800	.....	6,500	800
¾ in.	900	300	6,600	10,000
1 in.	22,300	15,000	19,400	21,000
1¼ in.	7,000	300	11,000	500
1½ in.	9,000	.....	7,500	.....
2 in.	6,000	.....	22,100	6,700
2½ in.	2,000	.....	400	.....
3 in.	.....	.....	700	.....
4 in.	2,500	.....	1,700	.....

POPLAR

	Stained Saps	No. 1 Com.	No. 2 Com.	No. 3 Com.
⅝ in.	34,000	26,300	1,800	.....
¾ in.	.....	9,000	.....	.....
1 in.	23,000	77,900	5,800	.....
1¼ in.	25,000	43,700	5,000	.....
1½ in.	1,700	11,000	22,500	8,000
2 in.	8,422	4,400	7,500	.....
2½ in.	3,700	15,800	600	.....
3 in.	1 400	2,900	31,000	9,000
4 in.	900	300	450	.....

QUARTERED RED OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,700	.....	9,700	500
1 in.	4,200	5,400	5,500	1,400
1¼ in.	5,900	.....	1,200	.....
1½ in.	.....	.....	400	.....
2 in.	.....	.....	8,400	.....

SAP GUM

	1 & 2	No. 1 Com.	No. 2 Com	No. 3 Com.
1 in.	.....	400	.....	.....
1¼ in.	.....	200	2,000	9,000
1½ in.	2,400	6,000	13,500	2,500
2 in.	5,100	.....	8,400	24,800
3 in.	.....	.....	.....	300

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	2,500	12,000
5/4	.....	14,000	.....
8/4	.....	15,500	6,000
10/4	.....	10,250	15,000
12/4	.....	3,500	4,000

PLAIN RED GUM

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	41,300	22,900	4,000	3,300
1¼ in.	21,000	63,325	600	600
1½ in.	30,000	61,300	15,500	5,000
2 in.	5,000	11,000	11,500	4,000

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	2,000	51,000	7,000
5/4	.....	18,400	31,800	200
6/4	.....	29,900	50,500	5,600
8/4	.....	42,300	39,500	15,000
10/4	.....	2,000	3,000	.....

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y.

Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

LELAND G. BANNING
CINCINNATI OHIO

If you want quick service send us your orders for **Oak, Ash Poplar, Chestnut, Mahogany, Walnut Etc.**

We are shipping from here every day and have had no trouble securing cars.

Canadian Representative: A. E. Klippert, 11 Laxton Ave., Toronto

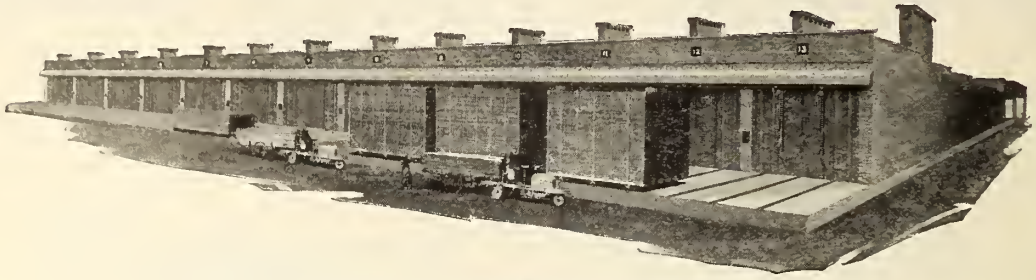
OAK
Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash and other Hardwoods

Oak Timbers and Planking

THE MOWBRAY & ROBINSON LUMBER CO.
Office: CINCINNATI, OHIO
Canadian Representative:
A. K. Johnson, Traders' Bank Building, Toronto, Ont.

KILN DRIED HARDWOODS



Kiln capacity 3,000,000 ft. monthly

WEST VIRGINIA
OAK
CHESTNUT
WHITEWOOD
BIRCH
HICKORY

We earnestly solicit your inquiries

AROMATIC RED CEDAR

ARKANSAS
RED GUM
SAP GUM
OAK
ASH
ELM

The M. B. Farrin Lumber Co.

CINCINNATI, OHIO

Dependable Shippers of American Hardwoods

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars

All Canadian and American Hardwoods

Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO

Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.

Subscription, Canada, Great Britain and British Possessions $2.00; United States $2.50; other Foreign Countries $2.00. Single Copies 15 Cents.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 **Toronto, September, 1922** **No. 9**

Delivery and Costs

The Ontario millman's query in the last issue, "What effect has prompt delivery on costs?" finds an echo in a letter just received from a Pacific Coast woodworker who complains that customers have a tendency to wait until the last possible moment when placing orders and then expect and insist on immediate delivery. His experience has been that orders for rush delivery cost considerably more than if allowed to go through in the regular course. In this he is on common ground with every other millman who has had any experience with the dilatory buyer—and what millman has not had dealings of this kind? Indeed, the customer who shops around for a month or so and then expects immediate delivery, is one of the banes of the woodworking industry—one of our sash and door friends the other day even went so far as to call him a parasite, who curbs the industry's ability to give proper service and do adequate justice to prior orders and interferes with plant efficiency and manufacturing costs.

There is no doubt that the prevalence of the practice referred to has a very pronounced effect on costs. The experience of our British Columbia correspondent, as related above, testifies to this, and many others with whom we have discussed the subject agree that costs are higher when a quick-delivery order goes through the plant—higher not alone on the rush article but also on the routine lines, the production of which has been necessarily delayed while the plant organization is adjusted to care for the special job.

This matter takes on serious proportions when a millman writes thus:—

"While we recognize that there are often legitimate reasons that prompt a customer to demand exceptionally quick delivery, we also are aware that such requests most generally come from those who are either over-dilatory in their buying or have been testing out the market for a considerable period in order to save the last nickel. This class of purchaser we are anxious to eliminate and to this end we have established a rule that the only claim to priority is early receipt of the order. With this our working principle, we have been able to build up a satisfied clientele through the consistent service we are able to give, coupled with satisfactory prices which are based on a cost of production that is not augmented by the necessity of handling quick delivery orders that are quick delivery only because the customers were so lackadaisical as not to realize their needs soon enough."

Many other millmen will readily join in commending this attitude although some manufacturers may possibly not like to be quite so severe in condemning the dilatory buyer or quite so hasty in attempting to eliminate him. However, the point is that delivery plays an important part in the matter of costs—a part that has, perhaps, not been sufficiently realized. In view of the vital importance of delivery, therefore, will not our readers cite their experiences that some idea of the influence of this factor may be obtained? A frank discussion that will do much to throw light on the subject is, therefore, encouraged and welcomed.

The Lumber Consumer's Interest in Grade Standardization

Any movement that aims to secure a more perfect formulation or definition of lumber grades and nomenclature and more adequate guarantees for the consumer of lumber is one that commands our hearty endorsation. More especially do we, as lumber consumers, need to be taken into conference on the matter of grade standardization, for the wood-using industry has certain definite requirements which, we fear, have not often been taken into consideration when mapping out a grading schedule. Many thinking people feel that there is a definite need for some revision in grading practices, the thought in this direction being well expressed in a letter which has recently been received by the "Canadian Woodworker." The writer of this states:—

"There has been in some quarters a large amount of loose thinking on the question of the proper function of grading and inspection rules and some have seemed to take the superficial view that their chief use is for settling disputes. Others say that what the grading and inspection rules are make little difference because whatever they are, prices will be adjusted to make them reasonably conform thereto. A very little reflection will disclose the fallacy of such reasoning because the primary object of grading rules should be to enable those who use the lumber—the fabricating manufacturers and consumers—to specify what they want and be able to get it, but the specification of what the consumer wants and needs, must have relation to what the producers are able to produce and supply. Therefore, the requirements of the consuming industries and the possibilities of the production industry must be considered not as matters of theory, but as facts. In other words, a proper formulation of grades must proceed upon an adequate survey, ascertainment, collection, compilation, and analysis of facts respecting both phases of the industry. When this is done, then grade rules can, as a result and by the united effort of the producers and consumers, be formulated so as to enable the fullest and most economical manufacture of the logs into lumber and the most adequate service of consumption

at the least cost and with the minimum of waste, and, therefore, with a very considerable conservation of timber resources."

As we all know, there has been growing up in the United States on the part of certain hardwood lumber manufacturers a distrust of the old rules relating to lumber grading and nomenclature, with the result that there was formed the Hardwood Manufacturers' Institute, whose avowed purpose is to develop rules embodying a standardized nomenclature "scientifically conceived and formulated, based upon practical facts of experience and of utility. These should be formulated by the manufacturers working in the fullest and closest co-operation with the consumers." We do not need to concern ourselves at this moment with the controversy that has grown up in lumber-grading circles on the other side of the line, nor do we need to pass judgment on either the Hardwood Manufacturers' Institute or the National Hardwood Lumber Association. The one point that interests us at this time is that any movement toward the improvement of grading practice should by all means take into account the consumers of wood so that the specifications that determine grade classification shall not be purely arbitrary but have some relation to the requirements of utility. Hardwood producers and hardwood consumers can certainly co-operate to such an extent as to determine a grading classification that will mean putting forest products to a better and less wasteful use. Canadian hardwood users will, certainly, realize the extent to which they are concerned in this vital matter, and we are sure that Canadian hardwood manufacturers will be willing to co-operate to the mutual advantage of the whole industry.

Advantages of Ready-Cut Dimension Stock

Industrial investigations made by the United States Forest Service on the production of small dimension stock at factories of the chair industry substantiate the chief claims made for ready-cut dimension stock. These studies revealed interesting waste and cost data which show conclusively that the advantage of obtaining small-sized stock from the mill are not all on one side. As the following summary shows, the factory owner and the lumberman would be equally benefited.

For the factory owner or wood user, ordering ready-cut dimension stock from the mill would:

1. Permit the purchase of clear, high-grade, ready-cut stock at prices equal to or less than those of clear high-grade lumber.
2. Eliminate the freight on waste which often runs from 15 to 55 per cent of the cost of the material f.o.b. factory.
3. Reduce the amount of the stock stored in the yard, and thereby reduce the amount of working capital required.
4. Reduce the real estate investment by decreasing yard and kiln space.
5. Largely eliminate the cutting-up room and thereby conserve floor space and labor or make it available for increased production.
6. Lower overhead costs by decreasing insurance, depreciation, real estate investment, working capital, power, and non-productive labor.
7. Solve the problem of hauling and carting waste.
8. In general, lower the cost of the finished product.

For the mill owner or lumberman the production of small sized stock would:

1. Offer opportunities for the utilization of short and crooked logs now left in the woods.
2. Lower the present stumpage by increasing the yield over the estimate.
3. Reduce the logging costs by increasing the amount of material obtained per acre.
4. Reduce the fire hazard by lessening the debris left in the woods.
5. Increase utilization at the mill of low-grade material and present-day waste, such as slabs, edgings and trimmings.
6. Decrease the investment per unit production.
7. Concentrate at the mill the waste now divided among woods, mill, and wood-using factory, and thereby afford greater opportunities of utilizing it.
8. Create a stabilizing influence on the entire industry.

Besides offering these immediate advantages to the industry, the production of ready-cut dimension stock at the mill would constitute a big step toward the conservation of the rapidly disappearing hardwoods. It would provide for a future supply, stabilize woods, mill, and factory labor, and prolong the life of the wood-using industries.

The Annual Financial Review

The Annual Financial Review (Canadian) for the year ended June 1922 has just been issued by Messrs. Houston's Standard Publications, Stock Exchange Building, 84 Bay Street, Toronto. To the man or woman who has money to invest, whether in large or small amounts, this is a publication that may well pay for itself many times over during the year, for it is a carefully revised precis of facts regarding Canadian securities. The information contained includes the latest annual statements of banks, railways, public utilities, industries of every sort, loan and mortgage companies, mines, etc. List of bond and brokerage houses are also given, with the standard charges for buying and selling. In addition to the annual report of each company, there is also printed in nearly every case the record of the buying and selling transactions in the different stocks for a number of years, thus giving the investor an opportunity to judge, at a glance, whether the past history of a stock is such as to make it a suitable investment for his particular needs.

Contrary to the opinion held by most inexperienced investors, comparatively few fortunes are the result of speculation. Insurance companies tell us that 95% of our population are more or less dependent upon their relatives in their old age;this in spite of the fact that perhaps 50% of our people have developed in a greator or less degree the saving habit and have placed their money at one time or another in what they believed to be "investments." The secret of old age dependence must, therefore, be due to the lack of knowledge about investments. For these reasons, it would appear that no person with money to invest could do better than pay $10.00 for a copy of this Annual Review and make a careful study of its contents. If an investor has large quantities of money at his disposal this expense represents an infinitesimally small portion of the savings that may be effected through accurate knowledge. For the small investor, whose all is counted in thousands, it goes without saying that a high factor of safety is of prime importance.

How to Bring Down Your Factory Costs

The Installation of New and Improved Equipment Alone is no Assurance of Lower Manufacturing Costs—Establish Basic Standards of Operation as a Goal Toward Which to Work—Create Employee Interest

By L. R. Wright*

In glancing through a morning paper, recently I noticed an advertisement bearing the same heading as this article. The two main points mentioned fit in so well with my own thoughts that it migh be of interest to repeat them:

"The first step: From the experience of successful manufacturers, pick the methods which improve upon the methods at present used in your plant.

"The second step: Compare the output from your present equipment with the output of the most modern equipment now available for your use."

The first step suggests that it is advisable to learn how other progressive manufacturers are cutting their costs, while the second suggestion points to the value of standards as a basis for comparing the relative productiveness of your plant, of your men, and of your equipment.

Most woodworkers are willing to admit that bringing costs down to where they should be is one of the most important problems confronting the factory executive. This is entirely different from recording costs, as there is little or no relation between costs as they are and costs as they should be. In each plant, however, there is a definite minimum cost for each individual operation. This will vary in different factories, depending on the equipment, layout, class of work and the productiveness of the workmen.

Before costs can be reduced to what they should be with any degree of certainty, definite minimum standards are necessary not only to indicate how much higher present costs are than need be but to establish a definite goal toward which to work. With such standards available the question resolves itself into the problem of bringing individual operation costs to as near the minimum standards as conditions permit.

Highly Specialized Work

The reduction of costs is in reality highly specialized work. When there is a cost system to be installed the first thought is to turn to a cost accounting organization. This is because such an organization is in a position to give value, specialized service, based on a broad experience in that particular field. Similarly, if confronted with problems in management or executive control, resort is made to the management engineering organization, for they in turn are able to give special service in that particular field. Carrying this thought further, an organization specializing in cost reduction work should be in the best position to secure worthwhile results in that particular direction.

Someone may suggest that if they want to cut the cost of some particular operation all that is necessary is to install some new or special equipment. Such a procedure might lower the cost on that particular item, but it would not necessarily bring it down to as low as it should be. To carry such an idea to its logical conclusion many woodworkers would be faced with the necessity of replacing every machine in their plant. This would entail a heavy outlay and while undoubtedly they would enjoy lower manufacturing costs after such a change they would have no assurance that the new figures would represent minimum cost based on the improved conditions in the plant.

The most noteworthy showing in the direction of lower costs can be made by having the productiveness of your present equipment and of your employees brought up to what it should be, based on basic standards, which show definite minimum operating times and direct labor costs. When that has been accomplished, you have established minimum costs as far as your present equipment and plant conditions are concerned.

The Human Element in Cost Reduction

The human factor is an uncertain element in a problem of this kind, and must be given every consideration if worthwhile results are to be obtained. Unless the equipment is operated to as near capacity as possible, and unless all waste effort has been eliminated, production costs are not as low as they might be. This suggests one reason why new equipment does not always effect the economies that were expected. The output of a new machine might be considerably greater than the equipment it replaced, but unless the stock is put into it in proportion to such increased capacity the output of the new machine is little if any better than the old one.

The recent experience of a furniture manufacturer might serve to illustrate this point. The capacity of an old planer was so low that it retarded production in other sections of the machine department. To overcome this condition a modern high speed machine was placed in operation. Shortly after this it was noticed that conditions in the machine department where the same as before the change. An investigation brought out the fact that the planer operator was carrying the same feed on the new machine that he had been accustomed to on the old planer, this in spite of the fact that the new machine was equipped with a round cylinder carrying four knives and would do good work at fast rates of feed. Here was a case of where increasing the capacity of the equipment did not increase the capacity of the operator.

Payment for Labor

The elimination of lost motion, the reduction of waste material and of unproductive labor and the simplification of operation all have their place in a cost reduction program. But before the costs are brought down to the minimum the hearty co-operation of all employees must be secured and in addition they should be given an incentive to do their best. Many employers have endeavored to create an incentive through paying on a piece rate basis but this method has been so abused that is has lost

*Statistician, Forest Products Engineering Co., Chicago.

favor. In addition the piece work rates were not usually based on a definite knowledge of what the work is worth but were guessed at or fixed so that the employee could earn about a fixed amount a day. Another drawback with piece work is that the rates must be raised and lowered with every change in general wage levels and furthermore, it is not practical to rate new articles and new designs until after a lot or two has been put through.

A bonus system is sometimes employed to overcome some of the objections to piece rates but here again the bonus is often in the form of an arbitrary amount added to the regular wage. In some cases, it is given only when the production exceeds a certain fixed figure. In any event it usually ends by becoming a part of the regular weekly wage and is in reality an increase in pay under another name.

Using basic time standards it is a simple matter to fix rates, in time per hundred pieces, that are fair to both employer and employee. Being basic and being expressed in time such rates are not subject to change with every fluctuation in general conditions; thus they are usually permanent, yet through them the employees may be paid only for what they actually produce, and the more they turn out the more they earn. Wherever applied this plan is unusually successful for the employees recognize its fairness and its reliability and as they are paid for what they earn, not according to the time put in, the result is increased productiveness and lower costs.

Why Not Make Use of Bench Machinery?

Portable Equipment Will Save the Woodworker Time, Labor and Money—Being Adopted for a Wide Variety of Operations by the Furniture and Wood Using Industries

In the July issue of the "Canadian Woodworker and Furniture Manufacturer," we told of the origin of the portable bench machine idea—an idea which has spread into thousands of plants, large and small, and into more industries than the originator of the idea thought possible.

The modern pattern shop can hardly be without these portable 4" and 6" jointers, universal, plain and band saws. The disadvantage without such time savers is very apparent and no thinking management would permit that vast volume of fitting, trimming, cutting, etc., to be done by hand when it can be done by machinery, built to handle even the smallest pieces, right at the bench in a superior manner and in a fraction of the time.

The necessity for this type of machinery for the pattern shop was well known to the designer when he brought out his line, but as pointed out in our July issue, numerous other industries soon adopted the idea themselves, and for the most part unsolicited. It is the old story repeated of the mouse trap and the beated path.

In the Furniture Factory

In the furniture factory you will find these now famous portable bench machines on numerous operations. The operations on which some put the machines are not done in all plants, of course; therefore, the matter of adopting these machines has become a more or less of an individual proposition. A majority of the cabinet rooms in the principle centers are equipped with these machines because cabinet makers and assemblers have considerable fitting to do—why do it by hand when these machines built especially to handle even the smallest or thinnest stock with safety can be so conveniently located?

In many of the plants which operate on the piece work plan in the department the workmen have purchased these portable machines so that they can increase their income.

Some manufacturers of period furniture find that they can save time in gluing on blocks by jointing the block on a small bench jointer. They run the block over this small jointer, touch it with glue and stick it on—the joint is so nearly perfect the blocks stick without clamping.

The Bench Machine in the Pattern Room

The efficient handling of the designing room or pattern room has been a problem. This quite a few furniture, auto body and various other manufacturers have solved by installing these portable bench saws and jointers. The pattern men have to do a great deal of their work by hand—an expensive proposition—or they have had to journey out into the shop and use the machines out there—this also was an expensive proposition for they hamper production and change set up on machines; and above all, the new styles or ideas get noised about the shop and are soon more or less generally known to competitors. You will find these high priced pattern men now confined to one room which is equipped with these machines on which they can do all ranges of work down to the smallest; they are speeded up in this work and are far more contented with conditions.

The cabinet and pattern makers do not share the benefits of this idea alone for the carpenter finds great time saving possibilities in these portable machines and you will find that many of the more progressive contractors and builders and even repair men take these machines with them to the job. On new houses they get the light wires installed as soon as possible so as to enable them to operate their machinery.

House carpenters in hotels, department stores and office buildings also take these portable machines with them about the building on construction and repair work.

Why Not Cut Your Own Costs?

We could go down the seemingly endless list of uses for this type of machinery but space does not permit. We have touched on these few in an effort to make suggestions that may start thought along the line and cause many of our Canadian manufacturers of anything in which wood is used to study their operations and see if they too cannot cut costs on various operations by adopting the idea. We understand Canadian dealers are authorized to place these machines on trial so that any reputable manufacturer can try the machines for any operation on which he thinks he can make a saving.

Layout of a Woodworking Plant from a Safety and Efficiency Standpoint

One Handling of Lumber in Storage Yard, Kilns, Dry Storage and Cut-off-Saws—More Substantial and Better Arranged Buildigns—Machines Properly Selected and Located—Safety Features in the Power Transmission—Exhaust System and Other Adjuncts

By Burritt A. Parks*

So much has been written of late concerning safety and efficiency in manufacturing institutions that it would be presumptuous on my part to assume to advance any new principles or ideas along these lines. It may be of some value, however, to place emphasis on the interrelation between safety and efficiency in laying out a woodworking plant.

The woodworking industry, as is well known, is one of the oldest in existence, and yet in many ways it has been slow in development and loath to adopt new principles of manufacturing. The principal causes of this condition are that many of the men in the industry are of the pioneer type who have grown up in the trade and are to a certain extent satisfied with conditions as they exist and also because technically trained men in the executive positions are few and far between. The development of practically all modern industries to their present states of efficiency has been largely due to the technically trained engineer and it is only in recent years that the engineer's influence has been felt in the industry.

Accidents Have Demoralizing Effect

The majority of woodworking plant executives do not fully appreciate the intimate relation existing between safety and efficiency in the designing of their plants or the production of their product. It may be stated as a maximum that what is done to promote safety for the employee or plant will also increase efficiency. Accidents cannot help but have a demoralizing effect upon the employees, depending in amount upon the seriousness of the accidents, their frequency, and the extent to which the employees learn of accidents throughout the plant.

The attitude of the management is always reflected throughout the organization and a management which is indifferent to the adoption of safety measures and the promotion of accident prevention may expect a smaller production per man, a greater spoilage of materials, a greater labor turnover, increased overhead, and a general lack of esprit de corps on the part of all employees, on which a maximum of production and efficiency in manufacturing so much depends.

Safety promotion, as I take it, not only considers the prevention of accidents to employees, but also takes cognizance of the prevention of accident or loss to plant and equipment. We may therefore apply the principles of safety and efficiency from the lumber yard right through to the shipping room.

Much thought may well be expended on the layout of a lumber yard, although in many cases I am inclined to believe it receives the least attention of any part of the plant. A proper arrangement of sidings, storage yards, dry kilns, routing of lumber into the plant, fire protection, etc., will pay excellent dividends on the study and expense involved in obtaining the best solution of the problem that the site will permit. In the first place, economy in purchasing will dictate the size of the lumber storage facilities, which should probably hold a year's supply. This will allow of taking advantage of market conditions and avoid delays incident to transportation difficulties. To my mind the ideal storage yard should be equipped throughout with industrial trackage laid parallel with the receiving siding. With this arrangement lumber is unloaded and sorted directly onto small lumber trucks on "bunks" and then by means of properly located transfer tracks the truck loads are placed in the storage ready to be taken to the dry kilns.

Placing the Dry Kilns

The dry kilns should be placed in a battery as to be readily served by the same system of transfer trucks that serve the storage yard. A dry storage shed of ample capacity, also equipped with trackage, will allow for an accumulation of dry material and thus avoid delays in receiving lumber at the cut-off saws.

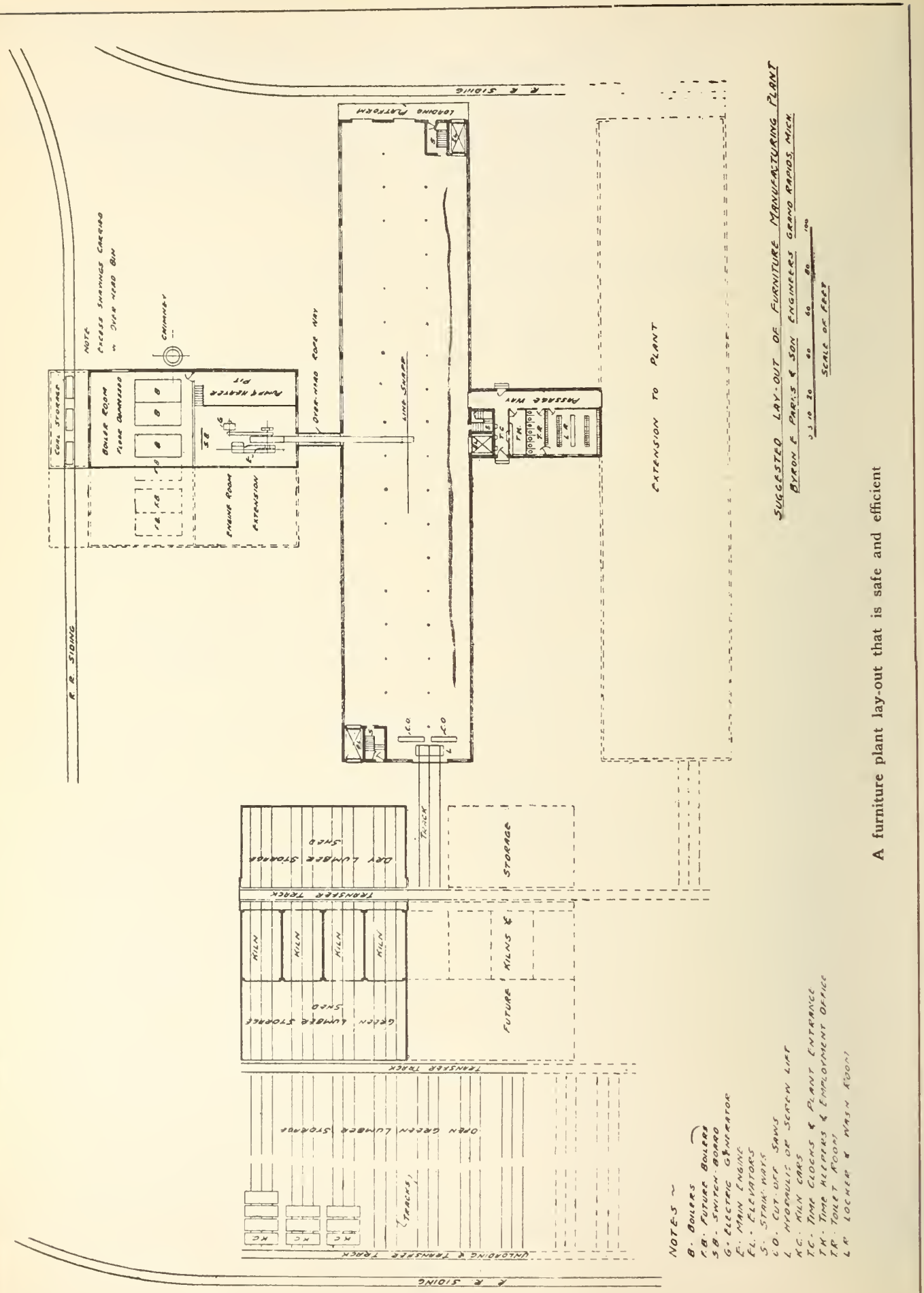
The same system of transfer tracks that serves the storage yard, kilns, and dry storage may be advantageously extended to the cut-off saws, where there should be provided hydraulic or screw operated lumber lifts.

It will be apparent that the arrangement of storage yard, kilns, dry storage, and cut-off saws outlined above will necessitate but one handling of the lumber from the railroad car until placed on the table of the cut-off saw. The efficiency in handling lumber and the decrease in opportunities for accident in this part of the plant is self-evident. This arrangement has the further decided advantage in that in case of fire in the storage yard the truck loads of lumber may be quickly moved, partially isolating the fire and allowing for access to same by whatever fire fighting methods are available.

If the lumber storage yard is not equipped with trackage the height of lumber piles should be limited to 18 or 20 feet with spaces between as ample as possible for ease in handling lumber to and from the piles and for access of fire fighting equipment in case of fire.

The receiving and handling of lumber should probably be given the greatest thought in providing transportation facilities to and from the plant, yet railroad sidings to the power plant for the delivery of machinery and coal, and to the shipping room for shipping the finished product, should receive careful consideration, keeping in mind that sidings to the lumber storage, power plant, and shipping room should have separate access to the main tracks, if

*Of Byron E. Parks & Son, Grand Rapids, Mich. An address delivered before the woodworking section of the eleventh annual National Safety Congress.



A furniture plant lay-out that is safe and efficient

possible, so that switching may be done on any siding without it being necessary to disturb the cars on any other.

Bulidings Designed for Their Intended Purpose

The type of buildings for any manufacturing plant should be carefully chosen to suit the purposes for which they are intended. In the past the purpose of a manufacturing building seemed to be little else than that of keeping out the weather and supporting the machinery and equipment inside. The modern manufacturing building must comply with several more requirements than those mentioned. A building should not only keep out the weather but should let in plenty of light and ventilation; it should not only just support the loads required of it but should do so with a proper margin of safety and as great an absence of vibration as possible; it should not only provide space for machinery, but should also provide ample space around machinery, with generous aisleways, in that greater efficiency in movement of materials and safety to employees will result; and, in short, it should be designed in advance for the work to be done—not simply built and then an attempt made to crowd in more machinery and equipment than the building will properly accommodate.

In order to comply with the above requirements, the building should be so designed that the glass area is a maximum with windows extending to the ceilings. Also to insure proper daylighting in the center, a building of the multi-storied type should not be over 50 to 60 feet wide.

It has been shown many times that excessive vibration not only causes rapid depreciation of machinery but also interferes materially with the quantity and quality of the product. Therefore, a building should be designed not only with considerations of strength in mind, but also rigidity and absence of deflection. If shafting and pulleys are used to transmit power, the floor structure should be laid out with this end in view, providing ample head room and substantial supporting members for shaft hangers and bearings.

Of the types of construction in use, the reinforced concrete building probably best complies with the above requirements of a good building, although a properly designed slow burning mill type makes a very satisfactory building and has one advantage over the reinforced concrete, in that machinery, shafting and equipment are more easily installed and alterations to machinery arrangement made.

Important Points of Machinery Layout

Much has been written concerning the layout of machinery in a woodworking plant to obtain efficient production and prevent accidents, consequently it will probably only be desirable at this time to emphasize some of the more important points to be kept in mind. In the first place machining should be carefully chosen for the work which it is desired to perform. Some machines are suitable for performing various operations, but wherever possible machines should be chosen for specific operations as it is often difficult to locate a machine performing several operations so as to obtain an efficient and orderly flow of material through the plant. It is also bad practice from a safety standpoint, as it is difficult if not impossible to design guards suitable for all the operations of which a machine is capable and if various guards are supplied suiting these various operations they must necessarily be of a temporary nature and are likely to be removed and not used.

It has also been my observation that machines which are provided with efficient guards by the manufacturers are more desirable than machines which have to have guards built by the purchaser. Homemade guards are frequently unsubstantial and do not entirely serve the purpose for which they are intended. Chain drive and gear guards in particular should be installed by the manufacturer, for they should preferably enclose the gear or chain drive completely. Such a guard not only serves to protect the workman but also materially affects the life of the machine by keeping dust and dirt from the bearings and other moving parts.

The Value of a Routing Chart

In laying out the machinery in a new machine room or re-arranging it in an old room, with the end in view of obtaining the most efficient layout, a routing chart should be drawn up. This routing chart should list each separate part entering into the finished product with the proposed volume of manufacture per unit of time. Such a routing chart giving the sequence of operations will establish in a general way the sequence or arrangement of the various tools and machines throughout the department.

A paper templet, to scale should be made of each article of equipment, such as all machines, tools, benches, racks, etc. Each templet should indicate the name of the machine or operation, the path of the product through the machine, the point of application of power, position of operator, and position of helper, if any. A floor plan of the machine room to the same scale as the templets should be prepared and then the templets placed on this plan and moved about and located in accordance with the routing chart until the most satisfactory arrangement is found, the marks on the templets allowing the machines to be set in proper relation to flow of product, power supply, lighting, etc.

Power Transmission

After an arrangement of the equipment has been completed a careful study should be made of how the product is to be transported from machine to machine, making ample provision for aisleways and location of trucks at machines to allow of efficient handling of material in and out of machines. Consideration should also be given to the necessity of providing spaces for accumulation of material between machines where the speed of handling varies.

The next important problem in laying out a machine room is to decide on the method of transmitting power to the various machines. There are in general two methods of driving machinery—shafting, pulleys, and belting and the electric drive. The electric drive may be further divided into two classes—the group drive and the individual drive. The decision as to which type of drive to use is dependent on several factors. In large plants with widely distributed machine rooms the electric individual or group drive is practically the only means of transmitting power efficiently and economically. In small and moderate sized plants the most efficient method of transmitting power is undoubtedly by means of line shafting, pulley and belts.

The transmission of power is one of the few features of a plant where safety and efficiency may seem to some antagonistic.

Electric transmission, properly designed and in-

stalled, is undoubtedly preferable from a safety standpoint to a multitude of pulleys and belts and possibly if proper statistics were available it could be shown that electric drive was the most efficient from the standpoint of cost when taking into consideration the fewer accidents resulting from the electric drive than from line shaft drive.

In any event the decision as to the proper method of transmitting power in any plant must be made upon a proper consideration of the various factors involved, the utmost safety and efficiency being kept in mind at all times. If line shaft drive be the final decision, it goes without saying that every means should be adopted for preventing accidents such as providing proper guards for belts and pulleys; using safety type set screws; cutting off projecting keys; covering up unused sections of keyways; and covering up or otherwise guarding all revolving parts which otherwise are likely to catch a man's clothing.

Another feature which will add materially to the safety of a line shaft installation is an automatic stop valve on the engine with electric tripping device. By locating push botton stations frequently throughout the plant, the engine and consequently all machinery may be stopped at a moment's notice and many accidents which would otherwise prove serious to both men and machinery be "nipped in the bud."

Safety in Electrical Installations

While, as pointed out above, the electrical transmission of power, when properly designed and installed, is better from the safety standpoint than line shaft drive, yet if poorly installed it may be more of a menace than pulleys and belting. In the first place all electric wiring in a woodworking plant should be installed in rigid metallic conduit. Open wiring is always dangerous to both men and plant and particularly so when inflammable dust may so easily be ingited by sparks. All motors of the direct current or slip ring alternating current type should be of the enclosed pattern in order to avoid danger from fire caused by sparks from the brushes. The squirrel cage induction motor may well be enclosed also to keep out accumulations of dust and dirt from the windings although the danger from sparks is not so prevalent as with the types above mentioned.

The motor starting equipment should also receive thoughtful study and all types of open switches and starters with exposed live parts avoided as one would the plague. Such equipment is a constant menace to both plant and men and should not be tolerated in this day and age.

Motors, unless connected direct to the machines which they drive, should be located overhead on suitable brackets or platforms and the platforms should be large enough in all cases so as to provide ample room for the repair man. Motor compensators or starters should be of the remote push button control type and should be located on the platform with the motor. This places them in a position where they cannot easily be tampered with and the only part of the equipment with which the workmen is concerned is the push button control station near his machine. Where group driving of machines is used it is advisable to use two or more push button control stations so that the motor for driving each group of machines may be started or stopped from several different points.

The remote push botton control starter is not only absolutely safe from the standpoint of the operator, but it also effects economies in the consumption of current for a workman has but to touch the "start" or "stop" button, as the case may be, instead of operating a clumsy compensator, or open switch, which he will avoid using as much as possible.

The Exhaust System

One of the important adjuncts to a woodworking plant is the exhaust system for the removal of shavings and sawdust from the various machines. If well designed it will pay large dividends in promoting the safety and comfort of employees, increasing production and making available for fuel a waste product that would otherwise be difficult and expensive to dispose of. Woodworking machinery produces large quantities of shavings and sawdust and if it is not removed as soon as it is made it soon accumulates on the machine, adding to the discomfort of, if not chance of accident to, the operator and necessitating frequent stops to clear away the refuse.

This refuse also forms a valuable fuel and if not delivered to the boilers by an efficient exhaust system it could not be fired in the furnaces without a great amount of labor being necessary to collect it and deliver it to the boiler room.

The exhaust should be carefully designed and installed and should fulfill the following requirements:

1. It should handle both light and heavy refuse satisfactorily.
2. The hoods should be designed where possible to also act as guards.
3. Hoods and piping should be laid out so as not to interfere with the operation of the machine, access to working parts, or obstruct the room.
4. It should be laid out to avoid danger of clogging and should have frequent clean-out openings through which to clear the system in case of clogging.
5. The exhauster should be selected striking the proper balance between first coat, power consumption, and power cost.
6. The separator should be ample in capacity so as to obtain efficient separation of the dust and deliver the refuse to the furnace with a minimum of excess air.

The advantages, in fact, necessity of a good exhaust system are generally so well understood that it does not seem necessary to more than mention the salient features here.

Better Illumination is Needed

Artificial illumination has been given very little thought and study in the majority of woodworking plants which I have observed. In a large plant which I visited recently they were still using gas lights in one of the machine rooms, although the remainder of the plant is lighted with electricity. It hardly seems necessary to state that gas lighting has no place in woodworking plant, particularly where electricity is available.

Even where plants are lighted with electricity the prevalent system, if system it can be called, consists of a drop cord and bare lamp over each machine or bench with a few thrown in for general illumination. Good illumination will add so tremendously to the safety and efficiency of a manufacturing plant that arguments in its favor seem almost superfluous. "Spotted" fixtures over machines are often advisable but at the same time the general illumination ought to be sufficiently brilliant so that men can see to get

around without stumbling over objects on the floor and so that production may be maintained with artificial illumination at the same rate as with daylight. There are many efficient lighting fixtures and reflectors, at reasonable cost, on the market today and a well laid out lighting system augmented by ceilings and walls painted a light color will pay dividends in increased production and decreased accidents, which will surprise any executive still adhering to antiquated methods.

Other features adding materially to the safety and efficiency of the plant, such as adequate fire protection, proper heating and ventilating, satisfactory elevating and conveying machinery suited to the needs of the plant, etc., might be dwelt on at length but can hardly be treated with the brief scope of this paper. In closing I wish to once more remind my hearers that as a general proposition whatever is done to promote the efficiency of a manufacturing plant will likewise promote the safety of the employees and any measures to promote safety will bring substantial returns in increased efficiency.

Dry Kiln Capacity Increased by an Improved System of Piling

Piping and Stacking Rearrangements Take the Fullest Advantage of the Natural Tendency of Hot Air to Rise—Stagnant Zones Eliminated and Rapidity of Circulation Increased

By A. M. Smith*

Mill operators are beginning to realize that drying lumber by artificial means does not pay where this is being attempted with the hit and miss method too often used, and the responsibility is being placed more and more in the hands of operators specially trained for the job. Existing kiln equipment has been analyzed, found wanting and remodelled to increase its capacity, or, where a new plant has been decided on much thought and investigation has been given to the different methods before letting contracts or buiding new equipment.

Nearly all existing kilns are built on the assumption that the hot air will rise through the lumber. The heating coils are accordingly placed in the building so that they will be beneath the load of lumber, as in Fig. 1, which shows a double track kiln 100 x 20 feet. A little consideration will convince the reader that improvements can easily be made in this arrangement.

The air passing over the heating coils at "A" rises upward and enters the load of lumber, but as soon as it does enter the lumber it begins to cool and becomes saturated and of course, since it is no longer hot air, ceases to rise and passes out at the sides as shown by the arrows. It will be readily understood that progressive drying takes place, the bottom boards having to dry considerably before the air can rise to the upper portions of the load. Some circulation is secured near the top due to the column of hot air rising from the piping in the centre between the cars, but it has been found that there is a stagnant portion as enclosed by the irregular line "B" which is last in drying, thus necessitating the whole load being kept in the kiln until this portion is dry.

*Chief engineer, Vancouver Lumber Co.

Rapid Circulation is Necessary

Everyone having anything to do with drying lumber knows that case hardening and checking are caused mostly by too dry a condition of the air in the kiln, that is, too low humidity, and one of the essentials of the operator is a hygrodeik, or wet and dry bulb thermometer. Although heat is the factor which does the drying, high temperature is not as necessary as a rapid circulation of air over each board; in fact, the more rapid the circulation and the less the difference between the wet and dry bulb temperatures compatible with reasonable speed, the better the drying so far as degrade is concerned. This can be accomplish-

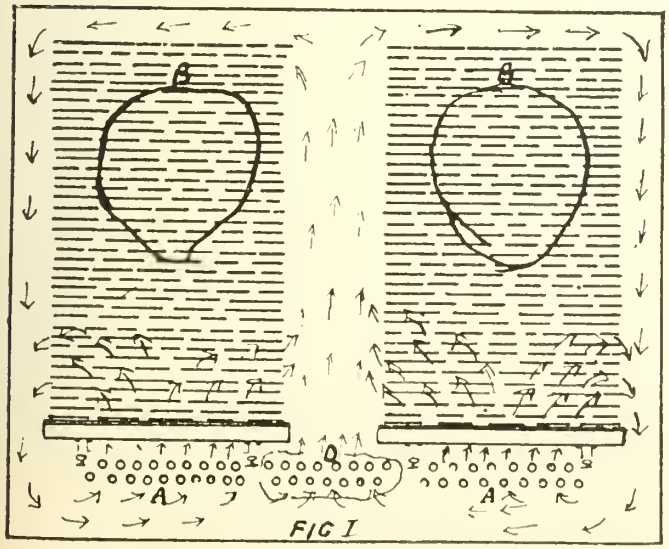


Fig. 1—Shows how areas of stagnation make for inefficient drying

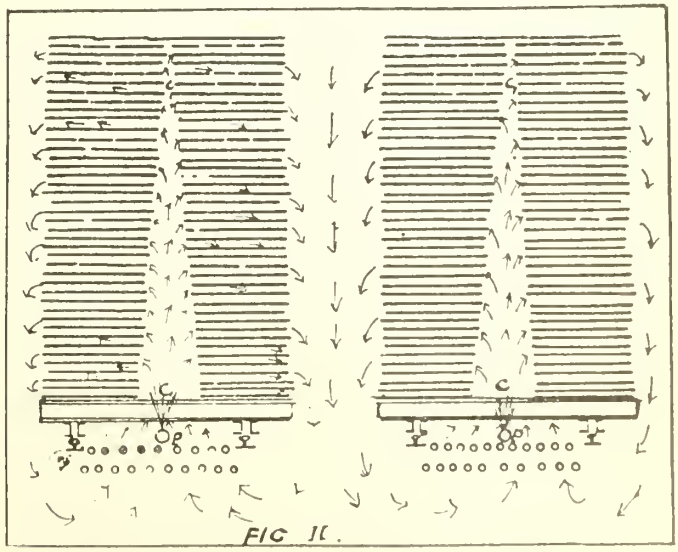


Fig. 2—Rearrangement of pile and piping facilitates circulation

ed in various ways. In some systems a fan is used to circulate the air in the kiln. This, of course, presupposes a charge kiln and is not very suitable for a progressive type of kiln, as the fan, in drawing the air from the lumber, mixes the air of high humidity with that from the dry end and of low humidity and in discharging the air again to the lumber does so at a uniform degree of saturation, making the wet end too dry, or the dry end too wet for good operation. It also entails the first cost of motors or engines to drive the fans, together with their belts, bearings, etc., and the maintenance of same.

Rearrangement of Kiln

Kilns can be arranged, however, that will take the fullest advantage of the natural tendency of hot air to rise and in which the steam necessary to maintain proper humidity is utilized to augment the natural circulation. The writer has made several changes in the "Standard" kilns with a view to increasing their capacity. At the present time we are using the system shown in Fig. 2, piling the lumber on the car

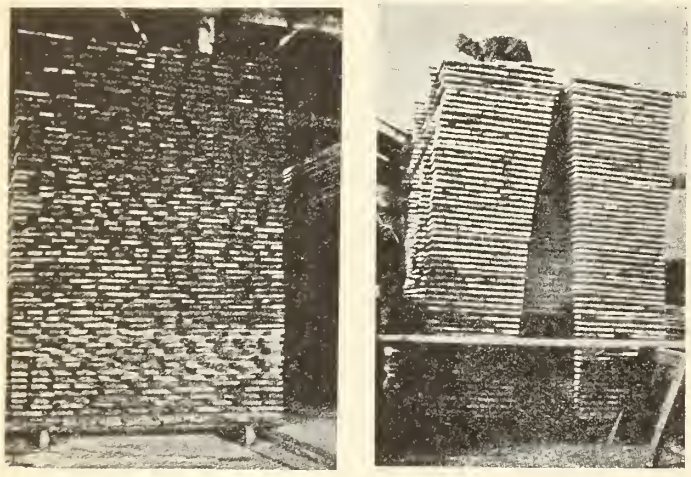


Fig. 3—The old and new piling methods

being the most important feature of the whole. The middle coil D, Fig. 1, has been done away with and in this case hot air rises as there is nothing to reduce the temperature of the air until it enters the layers of boards and we have the same temperature at the top of the load in the inverted "V" at c, as we have at the opening of the "V" at c.

The steam jets shown at P consist of a 1¼" pipe, which extends from the door at the wet end to within ten feet of the dry end. This pipe is perforated every 14" by a 1/16" hole and a pressure of about 40 lbs. is maintained on this pipe. The movement given to the column of air in the "V" is considerable. If the edges of the pile in the "V" are straight, as shown in the photo, the large amount of hot air entering at the bottom of the "V" is distributed evenly over each layer of boards; thus the top, middle and bottom parts of the load are drying uniformly. Notice also that the air has only to pass over 30 to 34" of board surface before returning to the heating coils, thus reducing the lay of the outside boards to a minimum.

Temperature Records

The following table shows the average temperature taken for a car of 1" lumber as it progresses through the kiln. A series of four readings were taken for each position of the car, the first being taken two hours after the car had been placed in the kiln and the others immediately after each move forward. A fresh car was run in at 7 a.m. and at 5.30 p.m. each day, making six moves before the car was drawn from the kiln, a total of 72 hours drying time. While as large a difference as 40 degrees F. was observed in the readings at some of the positions, the average shows that this is about as near progressive as could be desired:

	Temp. at "A".		Temp. at "C".	
	Dry	Wet	Dry	Wet
(1)	154	146	142	140
(2)	170	158	151	145
(3)	184	152	152	138
(4)	184	136	161	132
(5)	186	136	165	131
(6)	190	132	183	132

The kiln in which this load was dried had the fresh air shutter open 12" or 1 square foot. An anemometer gave a velocity of 1,639 ft. per minute, or a movement of air through the kiln of 1,639 cubic feet per minute.

Six hours after placing a load in this kiln the temperature of the entering air ten feet from the opening and after passing over the heating coil was 192 degrees F. dry bulb and 146 degrees F. wet bulb. The leaving air near the stacks and at the door at the wet end was 162 degrees F. dry bulb and 158 degrees F. wet bulb, or an entering humidity of 26% corresponding to 57 grains of water per cubic foot; leaving humidity 88% or 80 grains per cubic foot, or the amount of water carried off by the air passing through equalled (80—57) x 1,639 or 37,697 grains per minute, or 6.5 lbs. per minute or 380 lbs. per hour, or a total of 72 x 380=27,360 lbs. The kiln contains fifty thousand feet of lumber and taking the kiln dry weight to be 2,000 lbs. to the M, the total weight in kiln is 50 x 2,000 or 100,000 lbs. Taking the average moisture content to be ⅓ of the total weight, the amount of water to be removed will be about 30,000 lbs. which comes very close to the weight of water carried off by the air passing through the kiln.

Regeneration of the Air

It must not be assumed that it is necessary to have this amount, or any amount, of air passing through the kiln to accomplish the drying, as the air in the kiln can be regenerated or made capable of absorbing moisture by cooling and reheating; in fact, part of the drying in our case is done by the cooling effect of the side walls and the floor of the kiln. If the air leaving the lumber is near saturation or 100% humidity and becomes further cooled on passing down the sides of the building and in the comparatively cold part under the piping, it will drop a portion of its load of water on the floor. The air on again passing over the heating coils is made capable of absorbing more moisture. Where a closed system can be used and where only the leakage through doors and walls is lost, the steam consumption per M feet of lumber dried is of course somewhat less than in the ventilated system, where a large amount of heat is lost through the ventilators, as the gases passing out are never fully saturated.

A steam flow meter, on the kiln mentioned above, with an average load of 55 M feet in the kiln, shows a steam flow of 3,421.7 lbs. of steam per hour, or 62.2 lbs. of steam per hour per M—1.8 h.p. per hour per M. While this seems to be high, it will be found that this is about the proper allowance to make for drying lumber in any type of kiln.

Check Drying Operations Very Closely

If You do not Want to Lose Your Whole Kiln Load, Make Frequent Tests and Regulate the Drying Accordingly—Condition of the Stock is the Governing Factor

In the July "Canadian Woodworker" mention was made of the suggestion that too much attention is often given to the moisture content of the stock to the exclusion of other phases of the drying operation and the broader definition of what constitutes well dried lumber. While there was more or less truth in the ideas advanced and considerable justification for the suggestions made, yet the fact remains that the moisture content of the stock all through the drying operation is the very heart of kiln drying as practiced today and it is only through a close check on the moisture content of the charge, and a knowledge of the significance of moisture changes, that we can hope to dry lumber with a minimum drying loss and dry it so that it will be reasonably free from strain and stresses.

This, however, might best be illustrated by an outline of an actual occurrence in a well known furniture plant. The kiln was filled with two inch gum, which had previously been tested for moisture content. The kiln was closed and the stock was subjected to live steam for a number of hours. After the steaming period, the conditions in the kiln, that is, the humidity and circulation, were regulated so as to conform to the moisture content of the stock as shown by the tests made when the lumber was placed in the kiln and the run continued. After the stock was taken out it was found to be so badly checked and honey-combed as to be absolutely useless and could only be used for firewood. Now, then, where did the methods outlined fall down?

Condition of the Stock is Governing Factor

It is known and generally accepted that the condition of the stock, not time, is the controlling factor in drying lumber in a kiln and that at all times the humidity and temperature should be regulated in accordance or to put it another way, the E.M.C. (equilibrium moisture content) of conditions in the kiln should be maintained at a point slightly below that which actually obtains in the lumber. If the difference is too great, checking, case-hardening and honeycombing is likely to occur, while if the variation is not sufficiently marked, the rate of drying will be retarded.

In the case in point, the important fact that was overlooked was that steaming raises the moisture content. While the stock may have tested 15 per cent when placed in the kiln after being steamed for eight or ten hours the moisture content might be found to be 25 or even 30 per cent. Overlooking this increase in moisture content and regulating conditions to suit stock of 15 per cent and then making changes on a time schedule, that is, raising the temperature and lowering the humidity every twelve or twenty four hours, would mean that unusually secure conditions would maintain all through the drying period and as a consequence the lumber be damaged. This is evidently what happened and the result was a total loss of the whole kiln load of lumber.

The proper way is to make frequent tests all during the drying operation, and operate and regulate the kiln accordingly. This may entail extra work but it is the only basis upon which a kiln can be operated intelligently. There is no other way. It is all very well to raise the temperature five points and drop the humidity five points ever so often, say every twenty-four hours, but in doing that there is no guarantee that the condition of the lumber warranted the change or that it did not warrant it much sooner. The faster the rate of drying, the harder the drying is being pushed, the greater the need for testing frequently and regulating accordingly.

Make Frequent Tests

Slip-shod, hit-or-miss methods should not be tolerated in connection with the operation of the dry-kiln, for there is too much at stake. Not only is there the danger of spoiling the lumber during the drying period, but unless the stock is properly dried there is sure to be trouble later on. The proper operation of the dry kiln is so important that it is not an exaggeration to consider it the key operation in the whole manufacturing process. This feature of frequent tests should be emphasized for it is the only way of knowing how the drying is progressing. More than that, by testing the centre and outside of the samples separately the variation in moisture content will serve as a warning if it becomes too marked. A considerable variation between centre and surface indicates a tendency toward case-hardening if it does not show that case-hardening has already occurred. This merely serves to indicate how frequent tests assist in maintaining a close check on the drying operation.

Self Server is a New Wooden Novelty

The Canada Toy & Novelty Manufacturing Co., of Smith Falls, Ont., which began operations about a year ago, is perfecting a number of lines which will soon be placed on the market. One of the novelties which is being featured at the present time is a self-server. This device which sits on the centre of any table—is supported by a three-legged stand on which the top section is attached through a steel pivot, so that the server rotates freely. The stand is also detachable from the top section for conveniences.

The top is made from basswood, cypress, cedar, oak or any other suitable wood, eighteen inches in diameter with a round edge. The self-server is designed to hold pepper, salt, sugar, pickles, sauces, cheese, bread and other requisites found from day to day in the family fare. The self-server, of course, implies that the constant passing and repassing of these articles is rendered unnecessary by the fact that each person turns the self-server and helps himself to whatever he may desire.

If you are running a large mill, either by gas, steam or electricity, remember that you should have a variety of oils, heavy, medium and light, each for their particular purpose. A heavy cylinder oil will clog the running of a spindle.

Why Should Costs Vary by 73 Per Cent?

Estimates of the Cost of a Table and Two Benches Range from $37.13 to $64.81, While the Amount of Material Is Guessed to Be Anywhere from 94 feet b. m. to 148 feet—Obviously Something Wrong

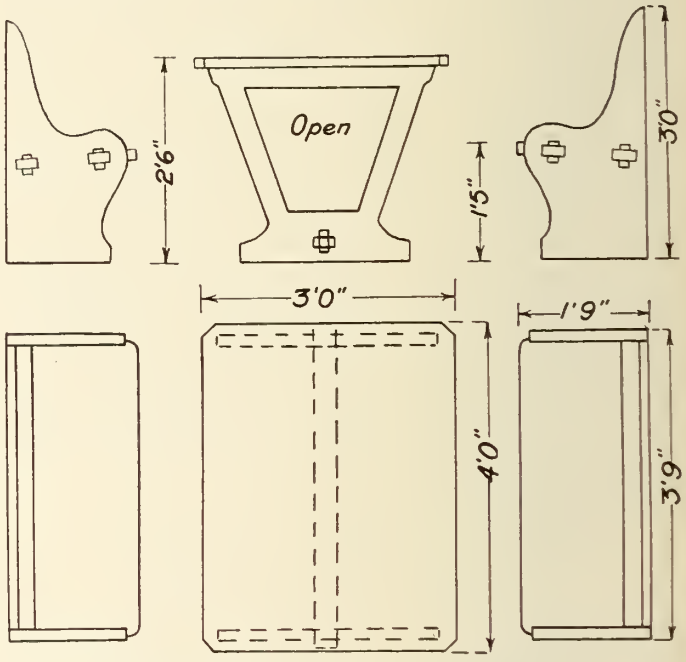
Subscribers in submitting cost figures for these articles which have been appearing month by month almost invariably commend our efforts in this direction and urge us to continue our policy of a monthly cost study. These words of commendation indicate that some at least of the woodworkers appreciate the object we had in mind when inaugurating this series. They, apparently, recognize, as we do, the fact that estimating procedure in the woodworking industry is not on the right basis. We are sure that even those who did not feel that there was much wrong with their estimating practice have, after studying the articles in the past few months, come to realize that there is something seriously wrong when estimated costs vary by the large percentage that are evident in the figures we print. In many instances the costs of the same article have varied almost as much as 100 per cent.

It was just to show up these facts that this series was started, in addition to which, of course, we had in mind the spreading of a little propaganda directed toward the solution of this guesswork procedure. It is quite evident that there must be something wrong when estimates vary by a large percentage. Either the low bidders are losing money or the high ones are making an excess profit or are operating at too high a cost. Making all due allowance for differences in conditions pertaining at different woodworking plants, there should not be the wide variation evident in many of the studies that we have published in the past few issues. If woodworkers as a whole would take to heart the lessons we wish to teach in these studies, they would make more effort to determine their exact costs on various operations and keep this information on tap for use in submitting estimates on new work. One prime object of every management of a woodworking plant is to do the work at the lowest cost—consistent with quality, of course—but whatever the cost may be, whether it is as low as it should be, the articles must be sold at a figure somewhat above the cost, if a profit is to be made. It is, therefore, essential that the true cost of every article and operation be known so that the selling policy can be arranged to net a profit on the firm's books. To this end there should be no guess-estimating, no haphazard or slapdash figuring. On the other hand every estimate should be the subject of a careful analysis of plant operations and methods so that the figure obtained may be considered as a reasonable expectation of what the cost of that particular article will be.

The wide discrepancy in estimated costs that has just been spoken of, is again evident in the cost study for this month—a breakfast room set comprising table and two benches, as detailed in the accompanying sketch. The list of figures given herewith briefly summarizes the forecasts of cost submitted by nine woodworking firms. It will be seen that these estimates vary all the way from $37.13 to $64.81, a variation of 73 per cent. Now it is evident that even making due allowances for the different conditions pertaining in different woodworking plants, most of these figures are away out. Either the low men will lose out on handling this job or the high ones will make too great a profit or their costs are too high and need some readjustment.

It is when we come to analyze the various factors involved in these estimates, however, that we see to what a dangerous extent these discrepancies work out. Take material, for example. One firm figured that 94 feet, b.m., were necessary for this job; another 95 feet; another 110 feet, and so on up to 148 feet. There is no reason on earth for such a wide variation in the estimated amount of material going into a comparatively simple job as this. Five or ten per cent ought to express at the most the difference between the high and low figures, but in this case we have nearly

This is the Job —



And these are the figures.

Where do you stand?

No.	Material	Waste	Bench hrs.	Rate	Machine hrs	Rate	Commercial Burden	Total
1	$ 7.52	20%	20	$ .85	6	$1.07	20%	$37.13
2	5.74	7%	34	.60	3½	1.50	20%	37.67
3	9.54	15%	21	.80	6	1.10	25%	41.18
4	10.20	10%	25	.92	7	1.15	15%	47.73
5	17.50	25%	16	1.00	8	1.25	15%	50.00
6	12.21	15%	33½	.88	6½	1.04	15%	55.73
7	11.61	20%	34	.85	6½	1.50	20%	60.34
8	11.47	15%	33.6	1.00	6.4	1.17	20%	63.07
9	14.10	20%	28	1.00	7½	1.30	25%	64.81

60 per cent—certainly far too much, and sufficient to indicate that millmen need some training in the matter of taking off quantities. Strictly speaking, the net quantities of material should be the same in every instance, the only difference being in the calculated amount of waste, and on this factor there should not be very much difference. The importance of the waste factor was emphasized in our last issue, this being governed by the grade of lumber bought or available and the availability of opportunities to use what would otherwise be waste. In the figures submitted to us this month the various estimaters calculate the waste at anywhere from 7 to 25 per cent. If one man can keep his waste down to 7%, then those others who waste one-quarter of their stock should give serious consideration to some means for eliminating or using up waste material. It is evident that the mill who can operate on a 7% waste basis is going to be more money in pocket than that which must consider a 25% wastage.

The estimated amount of labor and machine time involved in making this breakfast room set can be criticized in a similar way. The number of bench hours varies all the way from 16 to 34, with the latter figure, or something approaching it, involved in four of the nine cases. Machine hours spread from 3½ to 8 with 6 to 6½ predominating. Of course all shops do not handle a job of this character in exactly the same way, but we fear that many estimaters do not make a proper analysis of the labor involved in manufacturing these articles.

It will be interesting for the subscribers who have been good enough to supply figures, to compare their estimates with that of the Millwork Cost Bureau, whose estimate is given in the accompanying table as No. 8. In detail their figure is obtained as follows:—

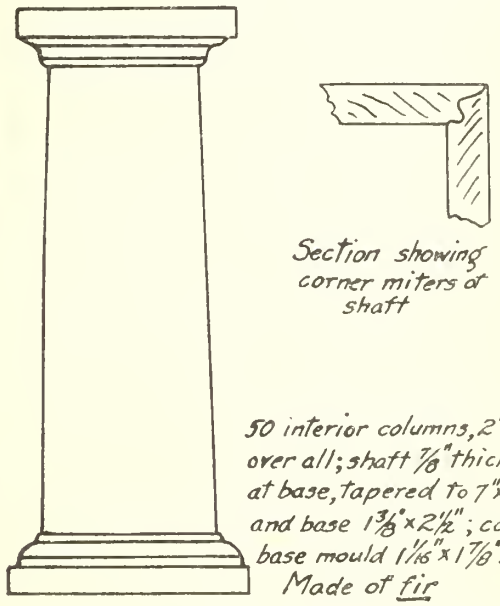
Material, delivered purchase price	$72.00		
Lumber burden	5.30		
Without waste	77.30		
Waste 15%	11.60		
129 net board feet @	88.90		11.47
Machine			
Labor 6.40 hours @	.60	3.84	
Burden 6.40 hours @	.57	3.65	7.49
Bench			
Labor 33.60 hours @	.66	22.18	
Burden 33.60 hours @	.34	11.42	33.60
Factory Cost			52.56
Commercial burden 20%			10.51
Total Cost			$63.07

The Millwork Cost Bureau, of course, bases its material prices at rates representing the Chicago market, but its wages and burdens are at rates representing an average of the entire membership. The total costs thus obtained are average costs, and if calculated on the basis of your own rates to reflect your own conditions, should give your cost of handling this work. With the number of machine hours and bench hours, determined by the Millwork Cost Bureau as necessary for the handling of this breakfast room set, there are two of our subscribers, Nos. 6 and 7, who practically agree. Some of the others are not so very far out, while there are one or two whose estimates are in no way comparable.

If our subscribers will just analyze these figures as they appear from month to month, they will see in what a bad condition estimating is. They will then realize that the good of the woodworking industry demands more careful costing and will do their part toward attaining this end. We urge that they help us in our efforts to further this object by sending us in their ideas on cost and by commenting on anything we may say in this connection.

For next month we have selected a comparatively simple job—an order for 50 columns of the type indicated in the accompanying sketch. These will be 2 feet, 3 inches high, over all, with a shaft ⅞ inches thick, measuring 8 x 8 inches at the base and tapering to 7 x 7 inches at the cap. We will consider them to be made of fir and produced in an odd work factory. Will not our readers take their pencils in hand and figure out just what they could handle this order for? Let us try to get an unusually large number of figures in the October issue so that the lessons to be learned from this study will be all the more evident.

Figure This Out for October


Section showing corner miters at shaft
50 interior columns, 2'3" high over all; shaft ⅞" thick, 8"x8" at base, tapered to 7"x7"; cap and base 1⅜"x2½"; cap and base mould 1 1/16"x1⅞". Made of fir

Let us see if we can't get down to real estimating this time. Send in your figures, so that in the next issue we may have a representative list of estimates for comparison.

Upholstered Furniture Association

The next mass meeting of the National Association of Upholstered Furniture Manufacturers will be held at Signal Mountain Hotel, Chattanooga, Tenn., October 10, 11 and 12. The tenth will be devoted to a meeting of the executive committee, on the eleventh the semi-annual meeting will be held, and on the twelfth the davenport bed makers will convene.

Edmonton Upholsterers Change Address

The Thornton-Perkins Co., upholsterers and cabinet makers, have removed from 10753 Jasper Avenue, Edmonton, Alta., to more commodious premises at 10628 Jasper Avenue.

Revised Standards for Wooden Boxes

In the New Draft of the A.S.T.M. Regulations, the Most Important Change is the Addition of a Rule for the Strapping of Boxes and the Reduction of Lumber Thickness When Strapping is Used

Numerous slight changes and a few more important ones are noted in the latest revision of the general specifications for wooden boxes, nailed and locked-corner construction, adopted by the American Society for Testing Materials, at its recent annual meeting. The committee of this organization, which has been aiming to formulate standards for shipping containers, has been working in close co-operation with other bodies having the same object in view, notably the National Association of Box Manufacturers, American Railway Association, the Freight Container Bureau, a subsidiary of the Bureau of Explosives of the United States, and the Forest Products Laboratory, Madison, Wis. The chairman and secretary of the committee of the American Society for Testing Materials are both connected with the Forest Products Laboratory.

While the revised specification is not final, it, at least, marks an important step forward toward the acceptance of standard regulations governing the manufacture of containers. The first draught was published in the "Canadian Woodworker" of September 1920, and while many of the clauses contained in the present specification, are similar, they are again reprinted in order to show their relationship to the whole specification. The most important change offered in the revised draught is the addition of a rule for the strapping of boxes (Section 15) and for the permissible reduction in thickness of lumber when strapping is used (Section 16). It is to be emphasized that the inclusion of these strapping rules does not mean that all boxes moving in transportation must be strapped, but that when strapped boxes are required, these regulations should govern. These regulations must be tentative for the present because regulations governing the use of round metal strapping, which are not yet drawn up, are needed to make them complete. When detailed specifications for unstrapped boxes are prescribed, strapped nailed boxes with thinner sides, tops and bottoms may be used.

The specifications as revised are as follows:—

1. These specifications are intended to apply to wooden boxes of nailed and lock-corner construction, and are directly applicable to the styles of boxes illustrated on page 64 of the July "Canadian Woodworker."

I. Material

2. The parts shall be made from thoroughly seasoned lumber. Under average conditions, thoroughly seasoned lumber has a moisture content of 12 to 18 per cent of the weight of the wood after oven drying to a constant weight.

3. All defects in the lumber that materially lessen the strength of the part, expose the contents to damage, or interfere with the prescribed nailing, shall be eliminated.

4. Ends, sides, tops, bottoms and other parts of a box shall be well manufactured and cut true to size.

II. Grouping of Woods

5. The principal woods used for boxes are classed for the purpose of specifications into four groups, as follows:

Group I: White pine, Norway pine, aspen (popple), spruce, western (yellow) pine, cottonwood, yellow poplar, balsam fir, chestnut, sugar pine, cypress, basswood, willow, noble fir, magnolia, buckeye, white fir, cedar, redwood, butternut, cucumber, alpine fir, lodgepole pine and jack pine.

Group II: Southern yellow pine, hemlock, North Carolina pine, douglas fir and larch (Tamarack).

Group III: White elm, red gum, sycamore, pumpkin ash, black ash, black gum, tupelo and maple, soft or silver.

Group IV: Hard maple, beech, oak, hackberry, birch, rock elm, white ash and hickory.

III. Dimensions of Parts

6. (a) The thickness called for in specifications for boxes of any given commodity will, unless otherwise specified, be understood as applying to woods of groups I and II.

(b) When the thickness of material in the following table are specified (for groups I and II woods), woods of groups III and IV may be used with the following permissible reduction in thickness:

Specified Thickness of Parts (Group I and II).	Allowable Reduction in Thickness for Groups III and IV.
¼ to ½ in., incl.	1/16 in.
Over ½ to 1 in., incl.	1/8 in.
1 to 2 in., incl.	1/4 in.

7. The occasional variation below the thickness of parts specified in Section 6 shall not exceed one-eighth of the thickness of the part.

8. (a) The maximum number of pieces allowed in any side, top, bottom or end of a box shall be as follows:

Width of Part.	Maximum Number of Pieces.
4 in. and under	1
Over 4 to 7 in., incl.	2
" 7 to 10 in., incl.	3

Over 10 in. shall average not more than one piece for each 3 in. of width and no piece shall be less than 2½ in. in width. Boards matched and fastened as provided in the following section may be not less than 1½ in. in width at either end.

(b) Two or more pieces ½ in. or over in thickness, fastened as follows shall be considered one piece in sides, tops and bottoms: butt-jointed or matched and fastened with two or more corrugated fasteners 1⅛ in. in length and of sufficient width to penetrate approximately three-fourths the thickness of the material.

IV. Manufacture of Boxes

9. The outside surface of boxes shall be sufficiently smooth to permit of legible marking. When surfacing of boards two sides is necessary for the protection of the commodities in transportation. The material may be 1/32 in. thinner than the minimum specified.

10. (a) Ends ⅞ in. or less in thickness, if made

of two or more pieces, shall be: (1) butt-jointed or matched, and fastened with two or more corrugated fasteners; or (2) cleated.

(b) The sizes of corrugated fasteners used shall be as follows:

Thickness of end, in	Size of fastener, in
3/8	1/4 by 1-1/8
7/16, 1/2 and 9/16	3/8 by 1-1/8
5/8, 11/16 and 3/4	1/2 by 1-1/8
13/16 and 7/8	5/8 by 1-1/8

(c) The number of fasteners used shall be as follows:

Length of End.	Number of Fasteners
16 in. and under	2
Over 16 to 24 in.	3
" 24 to 26 in.	4

(d) When three or more fasteners are required, they shall be driven alternatively from opposite sides of the end.

(e) Two or more pieces Linderman jointed shall be considered one piece.

Schedule of Nailing

11. (a) All nails shall be standard cement-coated box nails of the following length and gage (Washburn and Moen or American Steel and Wire Co. gage):

Size of Nails, "Penny."	Length.	Gage No.
2	1 in.	16
3	1⅛ "	15½
4	1¼ "	14
5	1⅝ "	13½
6	1⅞ "	13
7	2⅛ "	12½
8	2⅜ "	11½
9	2⅝ "	11½

(b) If other than cement-coated nails are used, 25 per cent more nails shall be driven than specified for cement coated nails. Plain nails driven through and clinched may be used for cleating.

12. The size of nails to be used is determined by the species and thickness of the material in which the points of the nails are held, and shall be in accordance with the following table:

Size of Cement-Coated Nails for Different Species and Thickness of Material

Species of Wood Holding Nails.	Thickness of Ends or Cleats to Which Sides, Tops and Bottoms are Nailed, in.								Thickness of Sides to Which Top and Bottom are Nailed, in.		
	⅜ or less	7/16	½	9/16	¾	11/16 or ¼	13/16	⅞	Less than ½	½ to 9/16	5/8 to ⅞
Group I woods	4	5	5	6	7	8	8	9	4	6	7
Group II woods	4	4	5	5	6	7	7	8	4	5	6
Group III woods	3	4	4	5	5	6	7	7	3	4	5
Group IV woods	3	3	4	4	4	5	6	7	3	4	5

NOTE.—If the designated penny of nail is not available, the next lower penny shall be used, and the nails spaced proportionately closer.

13. (a) The spacing of nails holding the side, top or bottom to the ends of a box shall be as follows:

Size of Nails, "Penny."	Space When Driven into Side Grain of End.	Space When Driven into End Grain of End.
6 or less	2 in.	1¾ in.
7	2¼ "	2 "
8	2½ "	2¼ "
9	2¾ "	2½ "
10	3 "	2¾ "

(In order to ascertain the number of nails to be used, divide the width of the side, top or bottom (or length of cleat) by the spacing specified for the size of nails to be used. Fractions in the result greater than ¼ if the points of nails are to be held in the end grain, and greater than ½ if the points of nails are to be held in the side grain, will be considered as a whole number.)

(b) When side nailing is used the spacing of nails holding top and bottom to sides shall be 6 to 8 in. When the material in the sides is less than ½ in. in thickness, side nails shall not be used, unless otherwise specified.

(c) No boards shall have less than two nails at each nailing end, except boards less than 2½ in. in width, which are butt-jointed or matched and fastened with corrugated fasteners as specified in Section 8 (b) may have only one nail. When cleats of the thickness of the ends are used, the nails shall be driven in the ends and cleats alternately.

(d) When box ends are cleated, the spacing of nails holding cleats and ends together shall be the same as the spacing of the nails holding the adjacent side, top, or bottom to the end. Each piece of the end shall be nailed to each cleat with not less than two nails, except that end boards less than 2½ in. in width which are butt-jointed or matched and fastened with corrugated fasteners as provided for in section 8 (b) may have only one nail.

(e) Nails attaching cleats to ends shall be of sufficient length to penetrate both thickness of lumber and allow for clinching. Either cement-coated or plain nails may be used.

(f) When cleats are thicker than the ends, nails shall be driven through the end boards into the cleats and clinched.

14. Nails shall be driven flush. Over-driving of nails materially weakens the container.

V. Strapping of Boxes

15. When boxes are specified with flat metal straps, either (1) unannealed straps without nails or (2) annealed or unannealed straps nailed on, shall be used,

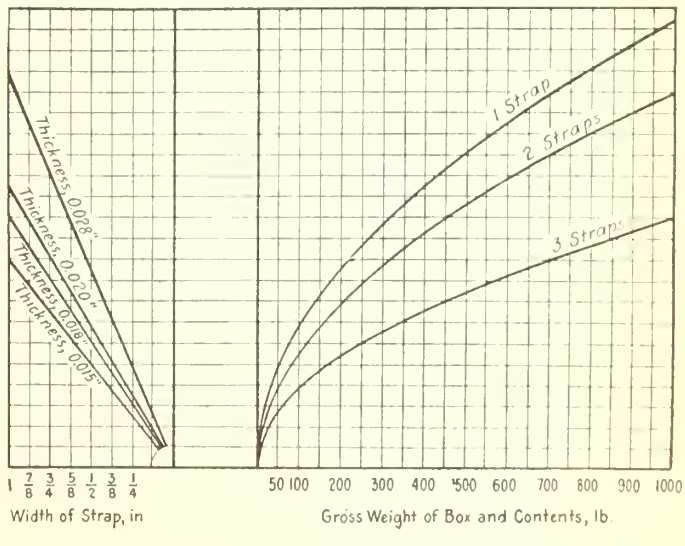


Fig. 1—Chart for Determining Size of Strap
Starting with weight of box and contents move directly upward to the curve for the number of straps to be used, then move to the left until intersecting the line representing the thickness of the strap to be used. The first vertical line at or beyond this point of intersection represents the width of strap required.

subject to the following requirements:

(a) When the straps are nailed on, they shall be placed around the ends of the box and held in position by the same size nails spaced twice the distance speci-

fied for holding the box parts together.

(b) Metal fasteners used to hold the ends of nailless straps together shall have not less than 75 per cent of the tensile strength of the strap.

(c) All straps shall be drawn so as to sink into the corners of the box.

(d) When two or three nailless straps are used, one shall be placed approximately one-sixth of the length of the box from each end.

(e) Fig. 1 gives the size of straps to be used on various gross weights of boxes. Starting with the weight of box and contents, move directly upward to the curve for the number of straps decided upon; then move to the left to an intersection with the line representing the thickness of straps to be used. The first vertical line at or beyond this point of intersection represents the width of strap required.

16. The thickness specified for sides, tops, and bottoms of unstrapped nailed boxes may be reduced to the thickness indicated below, when metal straps are used:

7/8	5/8	1/2
13/16	5/8	1/2
5/8	1/2	3/8
9/16	7/16	5/16
1/2	3/8	5/16
7/16	5/16	1/4
3/8	5/16	1/4

Rigid Crate Construction

Diagonal Bracing on Six Sides Gives Maximum Rigidity for Minimum Amount of Lumber

One of the features of a good crate is rigidity or ability to resist weaving and skewing during transportation. No method of joining the corner members of a crate, not even the 3-way corner construction, is sufficient alone to give rigidity to a crate. Some kind of bracing across the faces is usually necessary.

Figure 1 shows a kind of bracing found in many crates which are sent to the U. S. Forest Products Laboratory, Madison, Wisconsin, for testing. Partly because of the amount of material used, this construction appears to be very strong. Laboratory tests have shown, however, that crates so braced are weak in the diagonal direction of the faces, and are therefore apt to weave and skew during transportation.

Diagonal braces on six sides as shown in Figure 2 have been found to give a crate maximum rigidity for a minimum amount of lumber. Crates so braced withstood with considerably less distortion twice as great a diagonal compressive force in actual tests as crates braced as shown n figure 1.

A Combination of diagonal and parallel slat bracing as shown in figure 3, makes the crate more rigid than parallel bracing alone but not so rigid in all directions as cross bracing on the six sides. It may be found an advantageous construction in packing contents which need protection on the sides and are rigid enough themselves to withstand stresses in the direction in which the crate is weak.

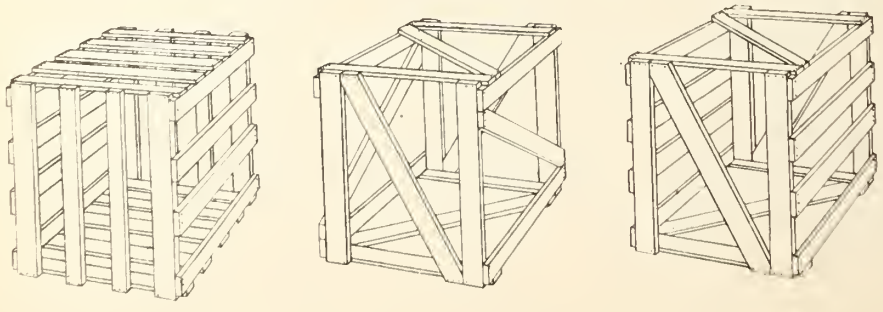
Solid sheathing on all the faces does not make a crate so rigid as diagonal bracing, except perhaps sheathing which is made of wide boards with tighter joints than can usually be obtained. The crate with ordinary sheathing might withstand as great a load, but the distortion caused by that load would be greater than in a crate with diagonal braces, and would ordinarily be great enough to allow damage to the contents.

Comparative Strength of Air-Dried and Kiln Dried Wood

Some wood users claim that kiln-dried wood is brash and not equal in strength to wood that is air-dried. Others advance figures purporting to show that kiln-dried wood is much stronger than air-dried. But some 150,000 comparative strength tests, made by the Forest Products Laboratory, of the U. S. Forest Service, on kiln-dried and air-dried specimens of 28 common species of wood show that good kiln drying and good air-drying have the same effect upon the strength of wood.

Tht belief that kiln drying produces stronger wood than air drying is usually the result of failure to consider differences in moisture content. The moisture content of wood on leaving the kiln is generally from 2 to 6 per cent. lower than that of thoroughly air-dried stock. Since wood rapidly increases in strength with loss of moisture, higher strength values may be obtained from kiln-dried than from air-dried wood. Such a difference in strength has no significance, since in use a piect of wood will come to practically the same moisture condition whether it is kiln-dried or air-dried.

It must be emphasized that the appearance of the dried wood is not a reliable criterion of the effect the drying process has had upon its strength. The strength properties may be seriously injured without visible damage to the wood. Also, it has been found that the same kiln-drying process can not be applied with equal success to all species. To insure uninjured kiln-dried material a knowledge of the correct kiln conditions to use with stock of a given species, grade, and thickness, and a record showing that no more severe treatment has been employed, are necessary.



The middle crate is the most rigid of the three. The left hand crate possesses very little rigidity.

Machinery & Equipment

A Glue Pot with Automatic Heat Control

Almost all of our readers at some time or other have had difficulty in using glue because of the great variance in the flexibility of glue mainly due to uneven heating. Glue, like most other similar substances has a certain point of temperature where it attains its greatest flexibility and viscosity. To secure this, thermostatic heat control has been recommended but there has been difficulty in producing a satisfactory, controlled heat, glue pot which is fully automatic and requires no personal attention.

To fill these requirements, the Wallace bench glue pot, here illustrated, equipped with a reliable, fully automatic heat control device, has been produced. There are several exceedingly practical and interesting features incorporated in this new glue pot the foremost of which is of course the automatic heat control which keeps the temperature of the glue between 140 and 150 degrees at all times.

There is a tube immediately above the heating element containing a sensitive volatile substance which contracts and expands with the slightest change in temperature and provides a dependable action of ample power to actuate the control switch. When the heat reaches the proper temperature the control turns off the current. When the temperature falls a few degrees the heat is turned on again. Since this action is automatic workmen need not watch the

The Wallace bench glue pot

temperature and an increase in production is the direct result. The temperature gauge dial always shows the heat attained and together with the jewel, set in the base casting, acts as a visible check on the heat maintained.

The glue pot operates from any electric lighting circuit and is put in operation by merely turning the switch. The Wallace bench glue pot functions either as a water bath, hot air or dry heat pot and whichever way it is used it can never overheat though the current be left on over night.

There is a durable cast aluminum glue container supported by special retainer lugs which prevent floating when the pot is but partly filled. The escape of moisture is greatly minimized by this method of suspension. The base cover forms a dead air heat insulator chamber between the heating unit and the bench, and the air gap which surrounds the heating unit is further insulation between the heat unit and the base casting. The insulation and control of the current for fire protection have been approved by the Underwriters Laboratories. Part of the bail extends across the center of the pot as a brush wiper eliminating overflow and dripping.

This glue pot is adapted for heating any substance which requires a definite working temperature, such as heating or melting glue, wax, pitch, tar, sealing compound or resin and the following are the principal advantages claimed:

Wholly automatic in action and therefore requires no attention from workmen.

Glue is kept always and invariably at correct temperature for maximum strength and viscosity.

Eliminates losses through spoilage of work due to overcooked or underheated glue.

Can be used either as water bath or hot air or dry heat pot.

Can be used as glue cooker or as warming pot in connection with central glue cooker.

Heats quickly, thus saving time in getting work under way.

Cannot cause fire from being left on over night.

Maintains heat with minimum expenditure of electricity.

Does not boil, waste nor injure glue from over or under-cooking.

J. D. Wallace & Co. of Chicago make these glue pots in two, four and eight quart sizes and weights range from 20 to 40 lbs.

Machinery Exhibits at the Canadian National Exhibition

The Canadian National Exhibition is recognized throughout the length and breadth of the country as one of the best ways for seeing the latest and best in all lines of industrial achievement. This is quite as true of the woodwork industry as of any other and there is no doubt but that those of the wood-using industries who took a day off to visit this great industrial exposition, found many things of such a nature as to be helpful and useful in their every-day work. In the Machinery Hall especially, there were a number of exhibits that were worth any woodworker's while to visit, for they displayed some of the latest ideas in woodworking machinery and demonstrated some of the most up-to-date methods for working up wood in its various stages of manufacture. Among the woodworking machinery manufacturers who had space at the Exhibition were the following:—

Preston Woodworking Machinery Co., Preston, Ont.—The exhibit of this firm comprised several of their latest machines, the display being exclusively ball bearing and motor driven. The equipment comprised:—

Ball bearing, motor-driven, beltless swing saw.

Pony planer, fitted with four knives, round cylinder, sectional rolls and chipbreaker, ball bearings and

Stockbridge electric knife grinder for grinding knives on the machine.

No. 125 variety saw table with tilting table, ball bearing mandrel and individual drive.

Two-spindle ball bearing shaper with stand at rear carrying motor in place of countershaft. This machine has a detachable spindle top to avoid disturbing set-up when it is wanted temporarily for a new job.

Light hollow chisel Mortiser.

No. 132 36-inch band saw finisher in a grey enamel.

* * *

P. B. Yates Machine Co., Hamilton—This firm's exhibit included an A 1 planer and matcher; G 2 ball bearing edging and ripping saw and a No. 8 A.B. box nailing machine, which is the latest model of this class of machine. It nails a complete box in three strokes.

* * *

A. R. Williams Machinery Co., Toronto—This firm made quite an extensive showing of woodworking machinery, among which were the following:—

McKenzie rip, cross-cut and mitre saw table with boring attachment.

Williams tilting saw table with raising and lowering mandrel.

American Universal floor surfacer.

Oliver portable ball bearing bench planer and jointer with 60-cycle motor mounted on the cylinder.

Oliver bench jointer with round cylinder, driven by 25-cycle motor through a belt, the motor being on a pivoted mounting so as to keep the belt tight.

Beach No. 8 rip and cut-off saw with jointer and boring attachment. This is a machine of special interest to contractors.

Crescent No. 107 Universal Woodworker which combines a 26-inch jointer with round cylinder, band saw, rip and cross cut saw table, reversible shaper and boring machine. In addition, special attachments such as a hollow chisel mortiser and sander may be added. This machine is made in a variety of sizes.

20-inch Moak jointer.

Moak band saw with aluminum top wheel.

* * *

Cowan & Co., Galt,—The machines exhibited by this firm included some of their latest productions—power feed rip saws, hollow chisel mortiser, belt sander, automatic knife grinder for planer knives, and chain saw mortiser.

* * *

Elliot Woodworking Machinery Co., Limited, Belleville—In addition to the regular Elliot No. 5 Woodworker, this firm showed a 16-inch planer and a new saw table with jointer attached operating from a lighting socket. A new development also displayed was their regular floor sander with a vacuum attachment for the removal of dust.

* * *

Bond Engineering Works, Toronto—This exhibit comprised transmission specialties such as bearings, pulleys, cones, shafts, hangers, truck casters, etc.

Dodge Mfg. Co., Limited, Toronto,—This exhibit included power transmission equipment manufactured by this well-known firm, including their famous wood split pulleys.

D. K. McLaren, Limited, Toronto—This firm displayed their lines of belting, fasteners, lacings, D.K. wood split pulleys and Philips pressed steel split pulleys.

Dominion Belting Co., Hamilton—Leather belting.

Beardmore Belting Co., Toronto—Leather belting.

A New Glue Treatise by Bogue

Veneer workers and other glue users in the woodworking industry have long felt the need of reliable information upon the manufacture, testing, analysis and general application of gelatin and glue. The books on this subject are comparatively few and very often inadequate in the information they impart. Indeed, there have been developments and improvements in the art of glue manufacture and glue handling that find no place in the standard texts on the subject but have been dealt with only through the medium of technical and trade periodicals. Glue users will therefore welcome the appearance of one of the McGraw-Hill Book Company's new publication entitled "The Chemistry and Technology of Gelatin and Glue," which has been written by R. H. Bogue, Ph. D., industrial fellow of the Mellon Institute of Industrial Research of the University of Pittsburg and research chemist for Armour & Co. of Chicago.

While the statement is made by the author that efforts have been directed towards studying the subject from the point of view of the chemist rather than that of the plant technologist, there is a great deal of information that has very practical application and will be of value to the practical woodworker and glue user. A sample of some of the less theoretical aspects is provided in the series of articles that have been appearing of late in the Veneers and Panels section of the "Canadian Woodworker." These articles which have been written by Mr. Bogue for this journal, are based on material that appears in his new book.

To indicate to those interested in the scope of this work, the following is the list of contents:—Part 1. Theoretical Aspects. 1.—The Constitution of the Proteins. 2.—The Chemistry of Gelatin and Its Congeners. 3.—The Physico-Chemical Properties and Structure of Gelatin. 4.—Gelatin as a Lyophilic Colloid. 5.—Gelatin as an Amphoteric Colloid. Part 2. —Technological Aspects. 6.—The manufacture of Glue and Gelatin, by Ralph C. Shuey. 7.—Water Resistant Glues and Glues of Marine Origin. 8.—Tht Testing of Glue and Gelatin. 9.—The Chemical Analysis, Detection, and Estimation of the Gelatin and Glue. 10.—The Evolution of Glue and Gelatin. 11.—The Uses and Applications of Glue. 12.—The Uses and Application of Gelatin.

Sturtevant's New Catalog

The B. F. Sturtevant Co. of Hyde Park, Boston, Mass. has just issued a new 72 page "Engineering Bulletin on Pneumatic Collecting & Conveying." It contains 33 pages of pictures and diagrams, 17 pages of useful tables—how to find the size of fans, the suction, volume, r.p.m. and horsepower for any system, cubic feet of air handled per minute, size of pipe and ducts used, and various other valuable tables. Data is also given on dust collecting from grinding and polishing machines, tumbling barrels, sand blast machines, coal breakers, shoe machinery and the removal of fumes, gases, etc. In addition, there are parts on the conveying of pulverized coal, fibrous materials, coffee, ashes, wool, wood chips, etc.

Upholstering and Trimming

Down Upholstering With a Tufted Back

The Operations Involved in Covering a Roomy Chair With a Tufted Down Top Stuffing Over Springs

The chair frame illustrated in Fig. 137 introduces a new element in the handling of down upholstering, because this type of chair is best treated with a tufted back. The untufted back was dealt with in the last issue. The frame of the chair described in the present article is of generous dimensions and permits of the employment of springs in the back, thus creating a more luxurious type of upholstering than is possible without springs. The same chair, however, can be made with pad back.

In Fig. 138 we show the seat of the chair upholstered in the muslin, the front edge having been built up with a nosing as described in connection with previous illustrations, and the seat kept flat as a foundation for the down cushion. If springs are to be employed in the back as shown in Fig. 139, the canvas to support the springs is tacked on the outside back of the frame. On the arms, where no springs are used the canvas is on the inside of the arms as shown in this illustration.

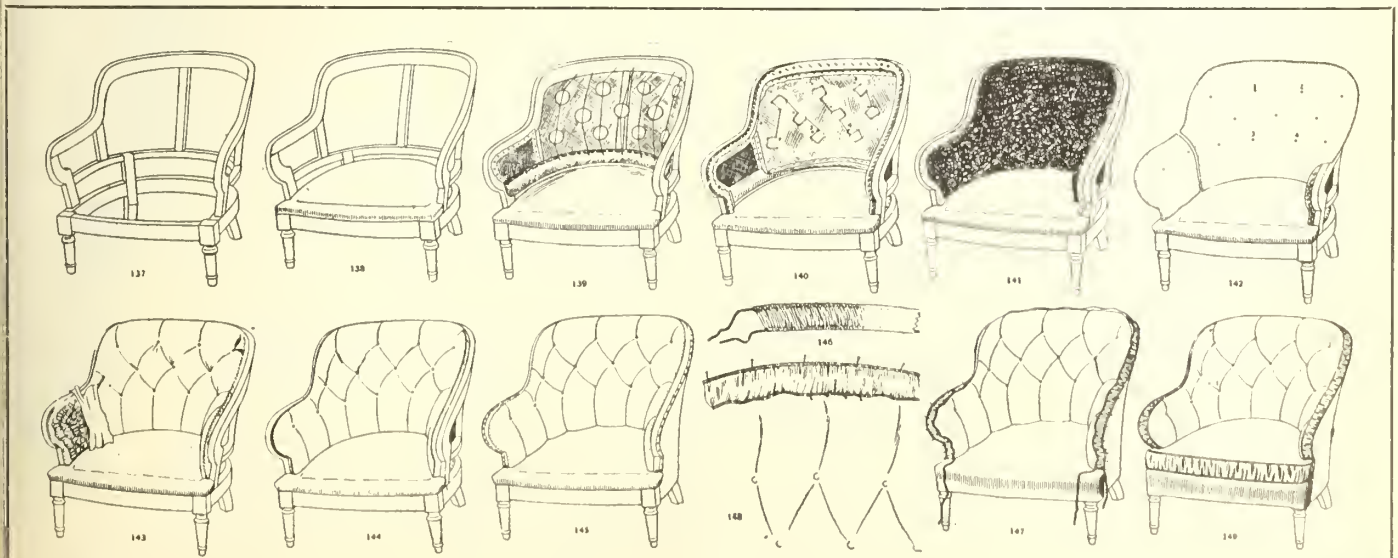
The pillow springs, employed in the back, are lightly tied down to keep them in place by twines which reach from the bottom to the top, but are not cross-tied, as cross-tying would interfere with the free play of the springs.

A stuffed roll forms a base for the upholstering and is built up around the bottom of the back as shown in the last mentioned figure. To this roll the canvass which covers the springs is sewn, as shown in Fig. 140. The canvas is also knotted to the springs, but is kept quite loose so as to prevent strain when the springs are depressed.

When the chair has reached this stage canvas for a nosing is back- tacked all around the edge of the frame, beginning at the lower extremity of one arm, circling around the back and coming down to the lower extremity of the other arm. This nosing is stuffed up as already explained in connection with other chairs. and lightly stitched so as to make a soft roll, square with the edge of the frame. The canvas at this stage is marked for buttons, as shown by the dots in Fig. 140, and tying twines are threaded through these dots, both ends being left free for subsequent use as shown in Fig. 141.

When the chair has reached the stage shown in Fig. 140 it is in condition to measure for the down pad which forms the top layer of filling. The down-proof ticking for the pad is cut the shape of the back, but an allowance of about three inches over all each way is provided for fullness. Note is made of the button marks on the canvas shown in Fig. 140 and similar marks are made on the pad covering, allowing an extra three-quarters of an inch between the marks for fullness. Thus, if the distance between marks 1 and 2 in Fig. 140 measured nine inches, the distance between the corresponding marks on the pad should measure nine and three-quarters inches and the distance between 1 and 3 in Fig. 140 would be increased about three-quarters of an inch on the down pad.

The entire back is next overlaid with hair between the twines, the twines being held upright during the manipulation of the hair so as to keep them free. The entire hair filling is applied by successive layers as shown in Fig. 141, keeping the edges neat and the nosing free so that the down-filled pad can be sewn to the nosing without interference.



Cycle of operations in the upholstering of a tufted back

When the chair has reached the stage shown in Fig. 141, the down pad which is made knife-edged (i.e., with no border), having previously been sewn and comfortably filled with about one inch of down, is pinned into place, as shown in Fig. 142, for the final fitting of the arms, which are made separate and sewn together after filling and fitting.

The strings which projected through the hair in Fig. 141 are now brought into play and the down-filled pad being treated as if it were the covering muslin, is tufted into place, the fullness being arranged into pleats and the edges sewn all around the nosing, as shown in Figs. 143 and 144. Where the tufting is tied in, it is advisable to use a small piece of cotton wadding beneath the twines, making the knot from underneath the pad rather than on top.

The next operation is the tufting on of the cover as indicated in Fig. 145. Instead of using buttons on light-weight silks, it is a practice in the fine shops now to use a French knot, made up of a small piece of the covering, sewn in rosette shape and tied through after the manner of an ordinary button. The outside lining is also put on when the chair reaches the stage herein indicated and the final finishing of this particular chair consists of the application of a ruffled band which covers the top edge of the back and arms. This band is cut the proper width to cover the raw edge of the covering which is sewn to the nosing around the outlines of the arms and back and an allowance of 100 per cent. for shirring purposes is made over the quantity required by the chair's outlines.

The edges of the band are turned over a soft cable cord and sewn close to the cord but not so tightly as to prevent the fabric slipping freely along the cord. (See Fig. 146.)

Having determined the measurement from X on the right hand side of the chair shown in Fig. 145 around the back to X on the left hand side of the chair, the band is shirred into this measurement, keeping the fullness evenly distributed. It is then pinned around the outside edge as shown in Fig. 147 and then on the inside edge. The band is pinned to the nosing (covering the edges of the cover in a straight line) manipulating the fullness as the work proceeds so as to keep the pleats radiating always in a straight line from the centre of the chair. The method of handling this fullness is indicated in Fig. 184.

After the front edge of the seat has been covered with a band of the same material as the chair covering, the down cushion made and edged with a ruffle similar to the back ruffle, the chair will have the appearance shown in Fig. 149.

Upholstery Sample Abuse

Some old philosopher has said that we eventually pay for what we get for nothing, and such is the case in the retail furniture trade in the matter of samples of upholstery covers.

It has been the practice in years past for manufacturers of upholstered furniture to furnish small cover samples without charge. Gradually the retail trade began to request larger samples, and still larger, until recently 24 inch square samples have become the rule rather than the exception. As the demand for the larger sizes increased gradually, manufacturers were slow to appreciate exactly what these samples were costing them. In fact, it is only a matter of months since the real expense involved was figured at all, and the result was astounding.

One manufacturer, whose largest business is in medium grade goods, kept an exact record on thirty-four sets of sample books, and he was dumfounded to discover that these thirty-four sets had actually cost him almost eleven hundred dollars. The bill for the cloth alone was eight hundred dollars—then there was the additional cost of the covers, the printing, binding, etc.

Although the industry was slow to recognize the leak this practice produced, it has finally reached the stage of national comment, and practically all of the large houses are now making a charge for large samples. They will furnish small samples to their customers without charge, but they are asking their dealer friends to pay for the big ones if they want them.

This change in policy was born of necessity. With a sample cost of one hundred dollars for every thousand dollars worth of goods shipped, it is evident that this practice would lead to disaster if it were allowed to continue and to grow. The cost of the samples was not figured into the cost of the goods, hence, in most instances, these costs formed a "leak" which did not develop until the day for accounting arrived.

Retailers, being good business men, appreciate the necessity of eliminating all waste in industry, and the vast majority of them quick to see the manufacturer's viewpoint. Now, instead of carrying a number of large sample books secured from various manufacturers, they find that one book, together with the smaller sample books of a number of makers, is usually sufficient for their needs. And they value the samples they have paid for far more than they valued the old ones which were given them without charge.

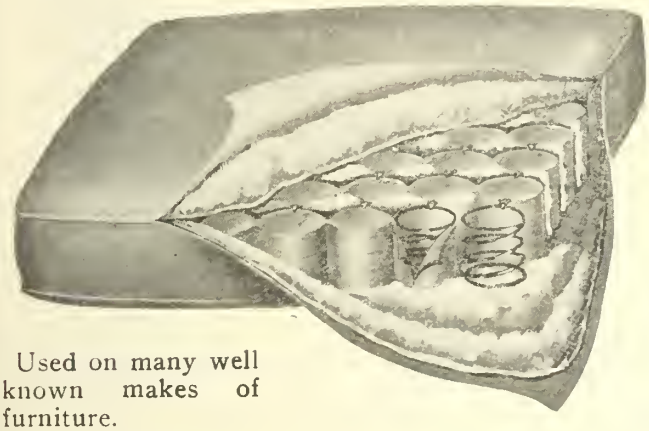
Eagle-Ottawa Leather Co.
TANNERS OF
FURNITURE LEATHER
OF EVERY DESCRIPTION
We are making a specialty of cutting
Spanish Split Leather for Chair Manufacturers
Quotations and samples furnished on application
We will be pleased to supply a very attractive sample book, of all our grades on application.
GRAND HAVEN - - - - - MICHIGAN

"COMFY" CUSHION COMPANY

Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.



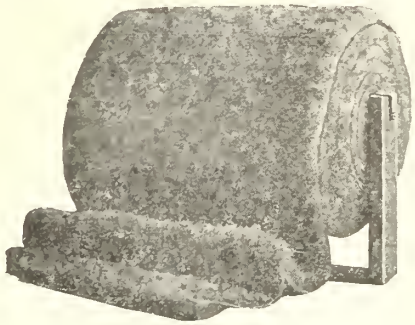
Used on many well known makes of furniture.

Write for Catalogue

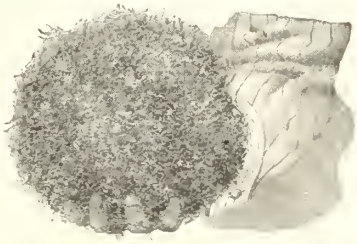
"Comfy" Cushion Co.

340 Gerrard Street, East, TORONTO, Can.

Woven Curled Hair



LOOSE-CURLED HAIR
In All Grades and Colors



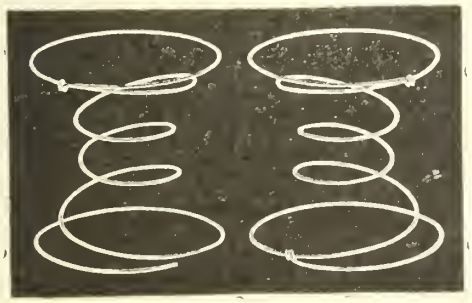
Samples Cheerfully Furnished

BLOCKSOM & COMPANY

Sterilized Curled Hair

MICHIGAN CITY, INDIANA

"IDEAL" FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,

of Canada, Limited

Windsor - Ontario

Look for Your Guarantee

PUBLISHING HOUSE of HUGH C. MacLEAN

For it's your protection against uninteresting reading.

Enquiries welcomed

Hugh C. MacLean Publications

LIMITED

345 Adelaide Street West, Toronto

DOON TWINES
MADE IN CANADA

—YOU ARE CORDIALLY INVITED—

To visit us at the Canadian National Exhibition, Booth No. 8, Manufacturers' Building.

When you have examined our exhibits, from the raw material to the finished twine, you will understand why

"DOON" TWINES STAND THE TEST

Booth No. 8 Remember!

DOON TWINES, LTD.

Mills at Doon and Kitchener

Head Office: Kitchener

MARIETTA WOOD AND METAL FINISH SPECIALISTS

Paste Wood Filler

The foundation of a wood finish is the filler. A weak foundation will not support the finishing coats and the entire job will be a failure. Marietta fillers have led in quality for a quarter of a century.

MADE IN ALL WOOD SHADES

Write for information

The Marietta Paint and Color Co.

Marietta, Ohio

Southern Factory - High Point, N. C.

"Save the surface and you save all"—*Paint & Varnish*

D&P QUALITY

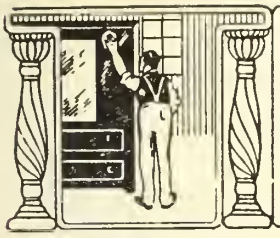
CURLED HAIR GLUE SANDPAPER

DELANY & PETTIT LIMITED

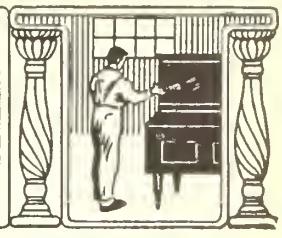
TORONTO.

OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC



THE FINISHING ROOM



New Developments in Stains

The Manufacturers of Wood Finishes are Constantly Working Out New Ideas to Give Good Effects at a Reasonable Cost

By C. J. Lavallee*

In the past few years there have been many improvements in the manufacture of wood finishing materials, particularly stains. In this process of development there have been many obstacles, of course. In the first place the manufacturer of wood finishing materials has had to contend with so variable an element as wood, and wood as used to-day would have been regarded by the manufacturer of twenty-five years ago as unfit for use. Every piece differs in texture and other characteristics. Hence, the stains must be made not only to meet new conditions, but to conform to the tastes of the different furniture manufacturers.

Stains Developed Primarily for Furniture

The stain business has really been built up around the furniture industry, and all the study and research given to the manufacture of stains was made necessary by the demands of the ever changing furniture designs and periods. The period furniture problem was brought about by the makers of the highest grades of furniture sending their men all over the world to visit the ancient castles, cathedrals, etc., to study at first hand the still remaining furniture of the different historic periods and copy them for their trade. They would copy both the design and color and come back and put them out, named after the period in which each had been in vogue. These manufacturers made their own stains as a rule.

As soon as they would get them on the market, the manufacturers of medium-priced furniture would take them up and endeavor to place these heretofore exclusive creations within the reach of their trade. They would come to us with the problem of matching the period finishes at a fraction of the cost of the higher priced goods. In this work we were really successful, and thus played our humble part in enabling the people as a whole to possess furniture representing the highest art at moderate prices.

The Kinds of Stains

Stains are divided into four general classes, water or acid, chemical, spirit and oil. The water or acid stain is fine, as you know, and on some woods will produce better results than anything else. But it has one serious drawback—it raises the grain and necessitates a great deal of sanding, which is expensive. A chemical stain is practically the same thing as a water stain, except that it does not contain aniline dyes.

The spirit stain is made from an aniline dye soluble in alcohol. It is very brilliant and beautiful, and easily handled, but unfortunately it is very fugitive and fades quickly when exposed to the light.

Then there is the oil group. The oil stain is the most practical so far as stains made on an aniline base are concerned, and is used extensively with good results on certain classes of work. But if the surface over which it is used is to be varnished, it has its very serious drawbacks in that it does not allow the varnish to dry properly. This is well understood by most finishers who have used them and there is naturally a very strong prejudice against oil stain for that reason.

We ourselves made very large quantities of oil stains, knowing their shortcomings, but there was nothing on the market that was any better. Later we got out improved stains, which embodied the good qualities of the different stains just enumerated with most of the faults removed.

But I want to consider a new stain, which was first made for the furniture manufacturing trade. It is a pigment stain and will be better understood by the painter, who has been making such stains for years. But while this is a pigment stain, it contains some materials that the painter is not familiar with and could not use if he were, because of the manner of putting them together. We have named it our "uniforming" stain.

You will be interested at this time, because you are, I am sure, asked to produce walnut or mahogany effects on gum wood. This uniforming stain made in both walnut and mahogany enables you to produce a correct effect in either of these shades on any kinds of wood, whether good red gum or the worst sap gum, or both together. Very good results can be obtained on either birch or pine. You can well realize that, because of the pigment it contains.

*President of the Marietta Paint and Color Co., before the Ohio Association of Master Painters and Decorators.

Two Finishing Firms Combine

There has just been announced the consolidation of the Grand Rapids Wood Finishing Company and the Walter K. Schmidt Company, of Grand Rapids, Mich. The Walter K. Schmidt Company has always held a unique position in the industrial field, specializing mainly on dyes, dyestuffs, and chemicals and in their service department rendering a unique service in matching, creating and making of stain powders. Their laboratory has devised many new methods for the production of new finishes on wood.

In January 1893 was founded the Grand Rapids Paint and Color Company which was reorganized in 1903 becoming the Grand Rapids Wood Finishing Company, devoting its attention to the furniture and general wood working industries, specializing in stains and fillers.

The personnel of the new company will henceforth comprise men well versed in the various phases of the company's activities. They are represented on the road by eight salesmen, six of them experienced finishers and two specialty men.

Night Finishing a Waste of Time and Space

Disadvantages of Over-Night Drying—Production Can be Speeded up by Drying the Article as Soon as Coated—Comparison of the Two Methods

The art of finishing today presents enough difficulties of its own, without our inviting additional trouble my sticking to outgrown ideas. The drying operation, for example, has become an exact process, both in time required and results obtained, yet many wood-workers are allowing out of date drying methods to slow up the whole factory.

Delays in the finishing process are due to two causes: first, the old idea that work must be coated during the day and dried over night; and second, old

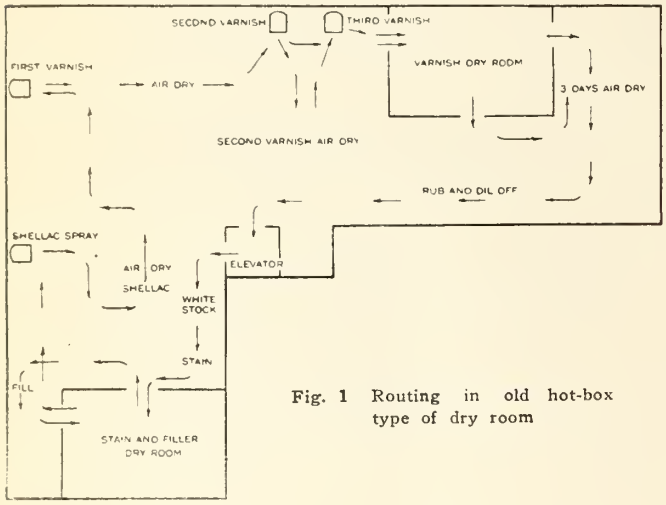


Fig. 1 Routing in old hot-box type of dry room

methods of routing the work, which involve much time loss through back-tracking. Both causes are easily removed by putting the drying operation on a modern schedule.

Disadvantages of Night Drying

In the last few years important changes have been made in the art of varnish manufacture, due both to the scarcity of certain ingredients and to the increasing demand for quick-drying coatings. New methods of applying the varnish coatings by spraying, flowing or dipping have resulted in fewer but heavier coats. Costs have risen in the finishing department, as in all other branches of wood-working. All these causes have made it necessary to install equipment capable of decreasing the finishing time, and so increasing the production for a given period.

While such equipment has been installed pretty generally, it has not been utilized to its full capacity except in the automobile industry. Wood-working plants, particularly those manufacturing furniture, pianos, phonograph cabinets, and similar articles, are actually getting only half-time production out of their dry rooms.

In progressive automobile plants the part is put into the dry room as soon as it is coated and dipped. In most wood-working plants the article is coated rapidly and efficiently, then allowed to stand until evening in the finishing room, or an open dry room, and dried over night. This delay causes work to pile up in various parts of the finishing room. It also allows the carefully applied finish to be damaged by dust, dirt, soot, insects and other foreign matter.

In addition, the old method of over-night drying usually produces incorrect drying. Most grades of varnishes are now manufactured for use in a dry room. If exposed to from five to seven hours of variable atmospheric drying, the coating has obtained a decided surface-set. Then when it is exposed for from eight to twelve hours to the more rapid drying atmosphere of the dry room, the surface becomes still further case-hardened. As a result, the oxidation of the drying oils and gums takes place at a relatively slower rate.

When once a siccative coating has obtained a decided surface-set, it cannot be correctly dried in a dry room, unless a sufficiently high relative humidity is carried to soften up the surface. Such an atmospheric condition will be very injurious to the other coated surfaces placed in the dry room the latter part of the afternoon.

This explains why the finishing department foreman is frequently puzzled, as he thoughtfully fingers his coated pieces after an over-night drying. Often he finds that the piece which was coated the last thing in the afternoon is more satisfactorily dried than its neighbor, which he knows was coated early in the forenoon.

Day and Night Drying Methods

The disadvantages of night drying can be easily eliminated by drying the article as soon as it is coated. This will make it possible to operate the drying

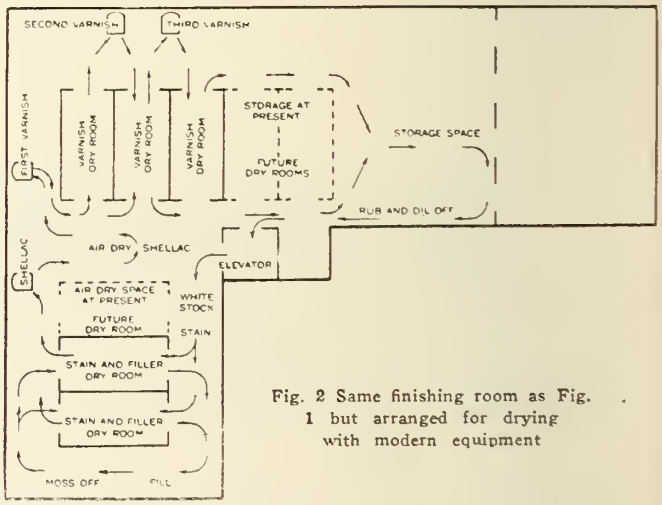


Fig. 2 Same finishing room as Fig. 1 but arranged for drying with modern equipment

room with two shifts, and so speed up production.

To illustrate accepted methods, we present a series of diagrams showing typical arrangements of dry rooms now being installed by progressive manufacturers. The accompanying drying schedules cover the various classes of finish used in the wood-working industry.

Diagram No. 1 shows the arrangement of dry rooms and routing of work in a typical furniture finishing room using the old hot-box type of dry room on an over-night drying schedule. Diagram No. 2

shows the same finishing room with the arrangement of dry rooms and routing of work when using modern drying equipment. The two drying schedules follow:

Old Schedule

Type of finish—medium and high-grade mixed suites.

Stain applied in daytime; in dry room over night.

Filler applied in daytime; in dry room over night.

Shellac or shellac substitute applied in daytime; air-dried over night.

First varnish coat applied in daytime; allowed twenty-four hours to air-dry.

Second varnish coat applied in daytime; in dry room over night.

Third varnish coat applied in daytime; dried over night.

Storage time between third coat and rubbing, three to four days.

Rub and oil off, one day.

Total time by old schedule, twelve to thirteen days.

New Schedule

Type of finish—medium and high-grade mixed suites.

Work stained in forenoon, put in dry room for four hours at 120-degs. temperature, 38 per cent relative humidity.

Work stained in afternoon; in dry room before 5 p.m., and dried for six hours, until 11 p.m., at 120-degs. temperature, 38 per cent relative humidity.

Work to be filled in forenoon, removed from dry room in morning; filled and mossed-off and dried for four hours at 120-degs. temperature, 38 per cent relative humidity; removed from dry room, sprayed with shellac or shellac substitute, air-dried over night.

Work to be filled in afternoon, removed from dry room, filled and mossed-off and in dry room by 5 p.m.; dried for six hours until 11 p.m. at 120-degs. temperature and 38 per cent relative humidity.

Work to be shellaced in forenoon, removed from dry room; sprayed, air-dried, sanded and first varnish-coated by 5 p.m.; dried for six hours until 11 p.m. at 116-degs. temperature, 42 per cent relative humidity.

Work to be shellaced in afternoon, removed from dry room, sprayed and air-dried over night.

Work to be first varnish-coated in forenoon, taken from space where it was air-dried over night, sanded, sprayed and in dry room for four and one half hours at 116-degs. temperature, 42 per cent relative humidity; sanded, second varnish-coated by 5 p.m. and in dry room for six hours until 11 p.m. at 116-degs. temperature, 42 per cent relative humidity.

Work to be first varnish-coated in afternoon, sprayed and in dry room by 5 p.m. and dried for six hours until 11 p.m. at 116-degs. temperature, 42 per cent relative humidity.

Work to be second varnish-coated in the forenoon, removed from the dry room, sanded, sprayed, dried for four and one-half hours at 116-degs. temperature, 42 per cent relative humidity; sanded, third varnish-coated by 5 p.m. and in dry room six hours, until 11 p.m., at 116-degs. temperature, 42 per cent relative humidity.

Work to be second varnish-coated in the afternoon, sprayed and in dry room before 5 p.m. and dried for six hours, until 11 p.m., at 116-degs. temperature, 42 per cent relative humidity.

Note: Work which is to receive only two coats is removed from the dry room to the storage space at the end of the drying period or in the morning.

Work to be third-coated in the forenoon, sprayed and put in the dry room up to 11:30 a.m. and dried for five hours, until 4:30 p.m., at 116-degs. temperature on the dry bulb, 42 per cent relative humidity; removed from the dry room and placed in the storage space, where it stands for approximately sixty hours before rubbing.

Work to be third varnish-coated in the afternoon, sprayed, put in the dry room up till 5 p.m. and dried for six hours, till 11 p.m., at 116-degs. temperature, 42 per cent relative humidity; removed from the dry room in the morning to storage space, where it stands forty-eight hours before rubbing.

Total time by new schedule, six to eight days.

Note: By the addition of one or more unit dry rooms, six hours more could possibly be saved between the application of the third coat and the rubbing period, with a proportionate increase in production.

A comparison of the old and new methods gives the following results:

	Old Method	New Method	Saving by New Method
Average time through finishing room, with allowance for Sundays and Saturday afternoons	14-15 days	6-8 days	7-9 days
Total floor space finishing dept.	16,200 sq. ft.	13,400 sq. ft.	2,800 sq. ft.
Total floor space, dryrooms	3,072 sq. ft.	2,560 sq. ft.	512 sq. ft.
Productive dry-room area	3,072 sq. ft.	5,120 sq. ft.	2,560 sq. ft.

In this case the saving of time in finishing averages 50 per cent. The actual saving of floor space in the finishing department is 17 1/3 per cent and in dry room space 16 2/3 per cent. Since, however, the new productive dry room area is really double by day and night drying, it might be said that the new method is saving the entire space occupied by the old method.

The release of stock in the finishing process approximates 40 per cent. The number of rejects has been decreased over 75 per cent and the dependability and uniformity of the drying has resulted in the prompt delivery of rush orders. Since the estimated cost of the old dry rooms is $5,200, as against $6,000 for the new, all these advantages are secured at an increase of only 15 1/3 per cent in the investment.

What the modern dry room can accomplish in factories having a large production of articles of practically the same size and shape, such as filing cabinets, phonograph cabinets, sectional bookcases, etc., is shown, the plant being equipped with seven drying rooms. In this instance the idea is to push through the finishing department the greatest possible volume of work in the least possible space and eliminate backtracking. The drying schedule follows:

Dryroom No. 1.

Load 7:30 a.m. to 9:30 a.m. ..... dry 9:30 a.m. to 1:30 p.m.
Load 1:30 p.m. to 3:30 p.m. ..... dry 3:30 p.m. to 9:30 p.m.

Dryroom No. 2.

Load 9:30 a.m. to 11:30 a.m. ..... dry 11:30 a.m. to 3:30 p.m.
Load 3:30 p.m. to 5.00 p.m. ..... dry 5:00 p.m. to 9:30 p.m.

Dryroom No. 3.

Load 7:30 a.m. to 9:30 a.m. ..... dry 9:30 a.m. to 1:30 p.m.
Load 1:30 p.m. to 3:30 p.m. ..... dry 3:30 p.m. to 9:30 p.m.

Dryroom No. 4.

Load 7:30 a.m. to 9:30 a.m. ..... dry 9:30 a.m. to 1:30 p.m.
Load 1:30 p.m. to 3:30 p.m. ..... dry 3:30 p.m. to 9:30 p.m.

Dryroom No. 5.

Load 9:30 a.m. to 11:00 a.m. ..... dry 11:00 a.m. to 4:30 p.m.

Load 4:00 p.m. to 5.00 p.m. ..... dry 5:00 p.m. to 9:30 p.m.
Dryroom No. 6.
Load 7:30 a.m. to 9:30 a.m. ..... dry 9:30 a.m. to 1:30 p.m.
Load 1:30 p.m. to 3:30 p.m. ..... dry 3:30 p.m. to 9:30 p.m.
Dryroom No. 7.
Load 9:30 a.m. to 11:00 a.m. ..... dry 11:00 a.m. to 4:30 p.m.
Load 4:00 p.m. to 5.00 p.m. ..... dry 5:00 p.m. to 9:30 p.m.

The average schedule for this installation is one day each for stain and filler, first varnish, second varnish and rub and oil off, making the average finishing time four to five days, allowing for Sundays and Saturday afternoons.

The total floor space in the finishing department is 17,600-sq. ft. and the dry room is 5,600-sq. ft., giving a productive dry room area of 11,200-sq. ft. The increase in the output is over 60 per cent and the decrease of material in process of finishing is from 30 to 35 per cent.—By C. H. Currier in Veneers, Indianapolis.

If you have a large number of screws to put into any class of wood, remember a machine will put them in five times as fast as a man.

Speeding up old machinery increases the risks of breakages and stoppages. Averaging these up, it will be found that what is gained one way is lost in another.

It's a whole lot easier for the small store in the small town or the so-called neighborhood store in the city to put a personal touch with each transaction.

Most folks do not think so, but there is an art in piling a stack of timber so it will be weather-tight, and dry without any undue warping.

Haley Bros. and Company Limited, woodworking manufacturers of St. John, N. B., have been operating without a pause at their big Broad Street factory. This firm is one of the best known woodworking manufacturing firms in the maritime provinces. It has representatives on the road throughout the maritimes and also caters to the provinces of Ontario and Quebec and the west. W. K. Haley, manager of Haley and Sons, is interested in the business life of St. John, and is a member of the Board of Trade. He is also vitally interested in playgrounds and has been president of the St. John Playgrounds Association, this organization having under his leadership progressed considerably in the expansion of activities and installation of new playground apparatus. Mr. Haley is also an active member of the St. John Y.M.C.A.

Cotton Linters

for the

Mattress and Upholstering Trades

Guaranteed quality at prices that will please you. Quotations gladly given on Cotton Linters or any of our other lines—Cotton Waste, Reeds, Rattans, Turpentine, etc.

E. T. CARTER & CO., LIMITED

84 FRONT ST. E., TORONTO

The wood finish that resists the effects of ROUGH usage

Furniture finished with ZAPONITE—the Pioneer Wood Lacquer—may be struck a blow or jammed sufficiently hard to DENT the wood, yet the finish itself will remain UNHARMED.

Furthermore, ZAPONITE will not check. It will not crack. It will not craze. And, being moisture proof, its use prevents warping, swelling and shrinking.

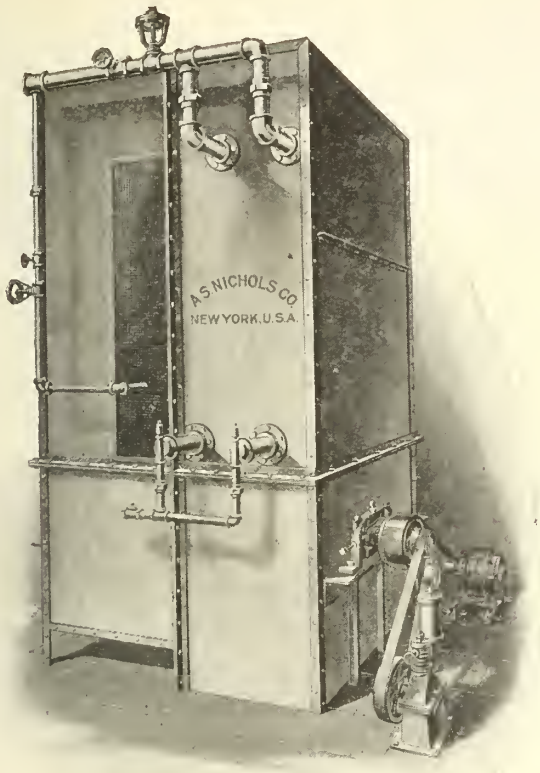
Let our Service Division help you determine how ZAPONITE can be used in finishing your products at a SAVING in your production costs. Write us about this service TODAY.

Celluloid Zapon Company

200 Fifth Avenue, New York City

Branches: Chicago, New Haven, Los Angeles

THE PIONEER ZAPONITE WOOD LACQUER



Vertical Equipment Floor Space 4 x 6 ft.
Crated and shipped complete ready to set on the floor outside of your varnish room

You Are Paying for This Equipment—

While using old fashioned Varnish Drying methods. The money you are losing will more than pay for this equipment in one year.

This statement is based upon a fact well known to manufacturers in every branch of the wood working industry.

IT IS A COMPLETE UNIT of fan, motor, heaters, air compressor, with automatic humidity and temperature control.

is manufactured in sizes suitable to all requirements, both vertical and horizontal.

eliminates dust and dirt by the use of a new humidifying air washer without the use of sprayheads, pump and pipe connections.

will triple the output of your finishing rooms—practically eliminates sanding.

will decrease congestion in your factory.

will reduce investment of goods in process.

will improve working conditions for your employees.

"SET IT OUTSIDE YOUR VARNISH ROOM"

A. S. NICHOLS COMPANY

Aeolian Hall

33 West 42nd St., New York City

Manufacturers of dryers for lumber, veneers, glued stock, varnish, paints, enamels, etc.

Increasing the Speed and Decreasing the Cost

of Your Finishing Room Operation

How practical, how advantageous and how dependable DeVilbiss spray-painting equipment is, has been demonstrated in finishing rooms of every size and line.

Not merely in dozens of finishing rooms, but in thousands of them. Not only where a few different kinds of articles are handled, but where every kind, size and grade of wood or metal product is finished. Not alone where varnishes, enamels or lacquers are used, but where every kind of liquid finishing material is applied. The

DeVilbiss

Spray-painting System

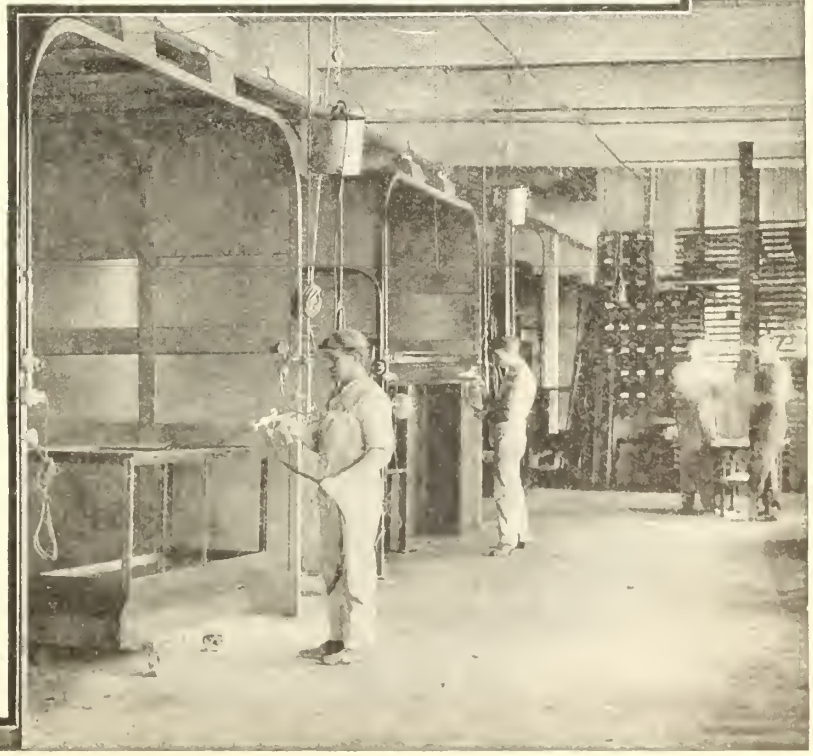
offers a complete, adaptable and guaranteed service. The finishing operation is speeded up 4 or 5 times over hand-brushing. A perfect, uniform coating is applied on all jobs. Working conditions are made more healthful and safer. Operating and upkeep costs are reduced to the minimum.

With your consent, we'll gladly tell you whether and how the DeVilbiss System can be of service and profit to you.

The DeVilbiss Mfg. Co.

3718 Detroit Ave. *Toledo, O., U.S.A.*

Paint your factory walls faster and better with the DeVilbiss Spray-painting portable equipment—let us explain.



BeVeCo VENEERS

"Brown Bird's-Eye Maple"

As Featured During the Summer Markets

EVERY maker of furniture is interested in the new color given to Bird's-Eye Maple. Here the craftsman's experience has been utilized to enhance the handicraft of nature.

Brown Bird's-Eye Maple is simply beautiful. In its new dress it opens up a multiplicity of uses for which it is especially adapted. It is the most striking veneer obtainable for two-tone effects, Bedroom Suites, decorative panels, novelty furniture, inlays and overlays—and any place in which a rich contrast in warm distinctive color is desired.

Brown Bird's-Eye Maple has become a standardized shade. Ask your wood-finishing house for a sample panel. The simplicity and economy of producing this color is proved. Your foreman can do it, when he sees a panel.

We will be pleased to have a finished panel sent you from your finishing house. This will show you exactly how beautiful and how striking this new finish is. Just write for a sample panel, it places you under no obligations. We'll gladly tell you more about.

"Brown Bird's-Eye Maple"

BIRD'S-EYE VENEER COMPANY
ESCANABA, MICHIGAN

Veneers and Panels

Best Way to Have Dry Veneers is to Keep Them Dry

Costly and Wasteful to Redry the Stock After Allowing it to Absorb Moisture in Storage—Why Not Control Heat, Humidity and Circulation in the Storage Room?

By S. H. Johnstone

"The best way to ensure having dry veneers is to keep them dry" recently remarked an old woodworker. He said he realized the importance of having the stock dry at the time of laying, but did not see the sense of permitting it to take up all the moisture it could absorb when in storage, and then redrying it just before the gluing operation. There is a lot of good practical commonsense in his ideas. How many times have you noticed veneer in storage under conditions that were far from what they should have been. For my own part I have seen expensive stock stored in an old leaky barn in the loft of some lean-to or annex or in some little used part of a damp basement. Under such conditions the material is bound to take up a lot of moisture, regardless of how dry it was when it was received, and if such moisture is not removed before the gluing operation, checks and open joints are likely to result.

Keeping such material in a special storage room or in some little-used part of the plant is better, for it is not so likely to be exposed to leaks and other forms of extreme dampness, but even under such conditions it is subjected to all the changes and variations which take place in the surrounding atmosphere. The result is that the moisture content of the material is not known, and resort must be made to redrying to secure uniform evenly dried stock.

To anyone who has not paid much attention to the way the moisture content of wood varies with every change in atmosphere conditions, the suggestion that storing veneers in the plant is not satisfactory, may sound like splitting hairs, but at the same time the suggestion is not without its significance. Take a few thin cross sections of wood and hang them up in various places throughout the plant and then weigh them every day and see how the weight will vary. As the humidity of the surrounding air increases, the pieces get heavier whereas if the surrounding air loses its humidity the test pieces respond and test lighter. Here we are not concerned so much with how much the piece will vary from one extreme to the other but the fact that it does vary precludes the possibility of storing veneer in the open shop and then using it with any degree of certainty that the moisture content is as it should be.

In many plants more attention is given to the storing of the thin stock. Special warm, dry storage rooms have been provided in which the flitches and rotary-cut stock are piled in neat, regular piles. Some even go a step further and hang a thermometer in the veneer storage and try and hold the temperature at some predetermined point.

All this is fine, but even so it does not ensure perfectly dry veneer. In the dry kiln, heat, humidity and circulation are controlled so that conditions in the kiln may be so regulated that the lumber is dried to the desired point. Why not go a step further then and turn the veneer store-room into a dry kiln in which the heat, humidity and circulation are under rigid control, permitting conditions to be held constant so as to give any E. M. C. desired. While an E. M. C. (equilibrium moisture content) of four or five per cent would be about correct, the conditions which would be maintained should be very mild, say a temperature of from 100 to 120 with humidity to suit.

If this is followed out what happens. Regardless of the condition of the stock when placed in storage it will gradually come into equilibrium with the controlled surrounding atmosphere, which means about 5% moisture content. That moisture content will remain constant as long as the surrounding atmospheric conditions are not allowed to change. The result is that the stock can be taken from the storage and worked up with the full assurance that it is in proper shape.

Following out this suggestion would not entail a heavy expenditure and would eliminate the necessity for redrying, either in special kilns or with special equipment. Nor is this the only economy which would result, for the drying loss attendant in redrying would also be saved. This should have an appreciable effect on the cost of all the products into which veneer enters and at the same time facilitate the movement of stock through the veneer department, for the delay and confusion, attendant upon redrying would have been eliminated. After all, the best way to ensure dry veneers is to keep them dry.

"Modern Glues and Glue Handling"

The Periodical Publishing Co., Grand Rapids, Mich., has just turned out a new treatise entitled "Modern Glues and Glue Handling," by Clyde H. Teesdale, who was formerly in charge of the section of wood preservation of the Forest Products Laboratory, Madison, Wis..

This book is based largely on the results that were obtained from the investigations which were carried out in the laboratory in connection with developing specifications and methods of test for glues used in aeroplane work. The result is that the contents of the book are eminently authoritative and practical. Glue users will find that they can considerably augment their present knowledge of glue handling by a thorough study of this treatise, the contents of which are divided under the following chapter heads: — General Discussion; Miscellan-

eous Glues; Uses of Glue Testing (Preliminary); Glue Testing; Viscosity; Jelly Strength. Strength of the Glued Joint; Plywood Strength Test; Specifications; Results of Tests on Miscellaneous Glues; Grading the Glue Sample; Some Interesting Strength Data on Glues; Use and Application of the Glye Hydrometer.

An appendix outlines the methods of testing animal glue at the Forest Products Laboratory.

Conditions Affecting the Adhesive Strength of Glue

The Influence of Joint Trueness and Gluing Procedure—How Pressure Influences Strength—Curing Conditions

By R. S. Bogue, Ph.D*

(Continued from last issue)

In the August issue the first of two articles on conditions affecting the adhesive strength of glue dealt with four of the factors involved, viz., (1) The concentration of the glue solution; (2) the time occupied and the temperature employed in heating the glue; (3) the temperature of the glue when applied; and (4) the species, density, porosity, and moisture content of the wood used. In this article the effect of nine other conditions is explained, completing the discussion on this important topic which is of interest to every glue user.

(5) The Trueness of the Joint.—The strength of a glued joint must be proportional to the area of the effective surface of the joint. If, in a joint of 4 square inches, only 3 square inches are in intimate contact, it must follow that the strength obtained will be much less than if the whole joint is in contact. Very little strength is developed by using glue as a mortar. The joined surfaces must be perfectly true to obtain the maximum strength. Sand paper should not be used to remove the last imperfections in the surface, for the powdered wood which is scraped off fills up the pores of the wood, and retards the penetration of the glue. A good plane should be the final tool employed. Under no circumstances, however, should tests be made upon joints which are not perfectly true.

(5) The Amount and Method of Application of the Glue in the Joint.—One often hears warnings against the "starving" of joints by using too little glue upon them. Of course, it is possible to use too little glue, and obtain a weak joint, but if the material is applied with a brush, or even a roller that is properly supplied, the danger of applying too little glue is almost negligible. The tendency among the consumers of glue is rather to use far more than is needed and squeeze out the excess. The waste in this procedure is often very great.

But little is ever heard regarding the other possibility—that of "overfeeding" the joint. If a large amount of glue is applied, and the excess is not squeezed or rubbed out, the danger of "overfeeding" may be a very real one. As the glue dries out in the joint it contracts, forming a honeycomb appearing structure, and joints of exceeding weakness may result. Whenever a broken joint reveals this uneven, honeycomb appearance it is sufficient proof that either there was too much glue allowed to remain between the two pieces of wood, or that the joint was not true, resulting in the same effect. The common practice of rubbing the joint together after applying the glue is beneficial only in that it works out of the joint the excess of glue. It may be safely said that the dangers of "starving" a joint are mostly illusionary, but the danger of "overfeeding" it are always imminent. If the amount applied is adequate, it is virtually impossible to rub or squeeze out so much that the joint is weakened thereby.

(7) The Temperature of the Wood when Glue is Applied.—When a warm glue solution is applied to a cold piece of wood, the layer of glue immediately adjacent to the wood will be chilled to the setting point before it can properly penetrate the pores of the joint. This must result in a joint considerably weaker than the maximum obtainable. The wood should be warm, but not hot. Excessive heating will expel more water than is desirable, and tend to warp the wood, making a true joint difficult to obtain. For this same reason the temperature of the glue room should be as high as is consistent with the comfort of the workmen, and a brief warming of the wood prior to the joining will be sufficient.

(8) The Rapidity of Handling.—A condition is observable in some plants where, on account of ignorance or indifference of the results incurred, an unnecessary lapse of time is allowed between the application of the glue and the placing of the joint under pressure. In such cases the glue has chilled and set to a jelly before the pressure is applied. In order to understand the detrimental effect of such a practice it must be emphasized that the influence of pressure is only to squeeze out the excess of glue, and to minimize the inequalities in the perfection of the joint. By permitting the glue to jelly before applying the pressure is to rob the pressure of its usual effect. A jelly will not readily be squeezed out. The result is a joint which contains an excess of glue between the sections, and, as shown in a previous paragraph, this very materially weakens the joint. The pressure should always be applied as quickly as is consistent with good workmanship after the spreading of the glue.

(9) The Pressure Applied to the Joint, and its Uniformity of Distribution.—So far as the author is aware, the only carefully conducted tests that have been reported upon the relation of the joining pressure to the strength of the joint are those described by Gill in 1915, and the investigations of the writer in 1920. Gill employed a joining pressure varying between 10 and 100 pounds to the square inch, and reported that "a pressure of 30 pounds to the square inch gave a joint about 15 per cent stronger than either the 10 or 100 pound pressure." The data obtained for the tests at the different pressures are not given, but the variation between the maximum and minimum values obtained is very great—averaging in the neighborhood of 200 per cent. This being the case it seems difficult to regard the 15 per cent variation reported for different pressures as significant.

Experiments which have been conducted in the writer's laboratory have shown high pressures are not only harmless but decidedly beneficial from the the standpoint of the ultimate strength developed.

---

*Industrial Fellow of the Mellon Institute of Industrial Research and Research Chemist for Armour & Co., Chicago.

This article represents a part of the section of the "Glue as an Adhesive" in the writer's treatise on "The Chemistry and Technology of Gelatin and Glue," published by the McGraw Hill Company of New York.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

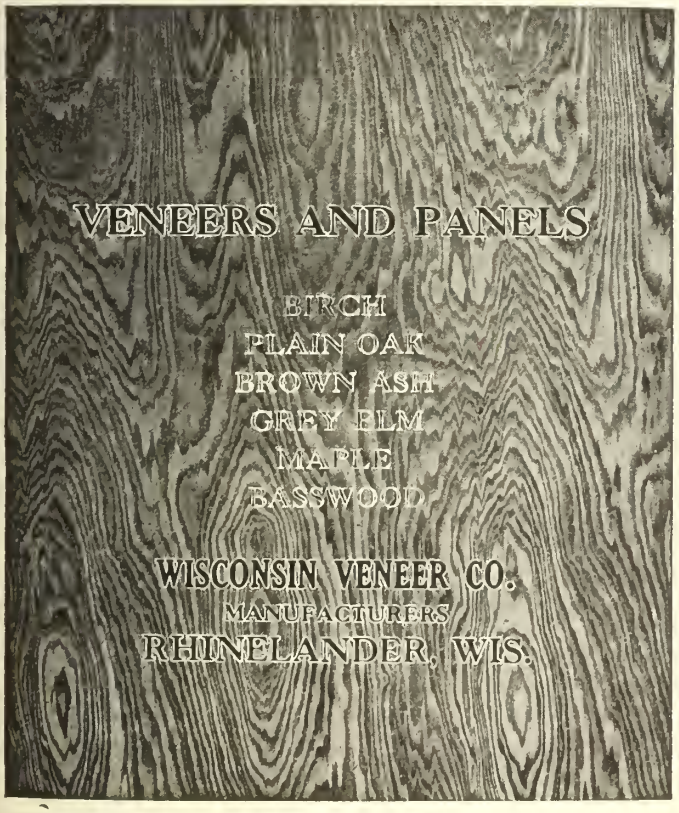
Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.



Litton Veneer Co.

Office and Mill Rockford, Illinois

Manufacturers

American Walnut Veneer and Lumber.

Plain and Figured Veneers of All Kinds.

Grand Rapids Office & Sample Room
192 Monroe Ave.
In charge of HUGH L. CURREN

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.
"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.
(When writing mention Canadian Woodworker)

(Continued from page 80)

Joining pressures varying from 10 to 1,400 pounds to the square inch were used. These pressures were obtained by placing the joints, very carefully prepared, between the parallel plates of an Olsen universal testing machine. A ball-bearing was used both above and below the steel plates to insure a perfectly uniform distribution of the pressure. Previous tests made by using clamps had shown the impossibility of obtaining either a constant or a uniformily distributed pressure by that means.

The data show the strength of the joint to rise rapidly with increasing joining pressure between 10 and 200 pounds to the square inch. Above the latter pressure the strength continued to increase slightly to 1,000 pounds, and thereafter remained constant to 1,400 pounds. This is illustrated by the curves in figure 1.

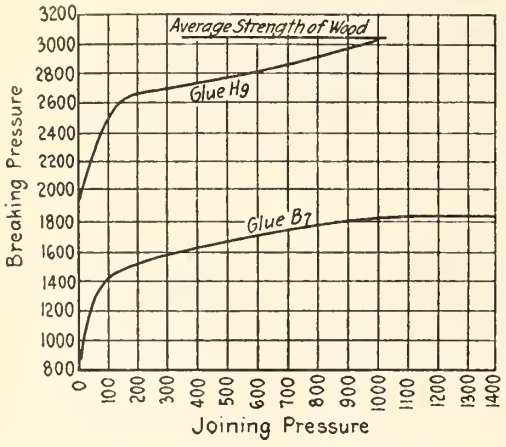


Fig. 1— The effect of joining pressure on strength

In the light of the frequent assertions made that "too much pressure must not be used in gluing surfaced wood, as the glue may be pressed out too completely from the joint, producing a so-called starved joint," a consideration of the meaning of these data may not be out of place. The writer has repeatedly emphasized that a glue is not a cement. Let us exaggerate the conditions for a moment in order to fix our point. Suppose that it is possible to make a joint of two pieces of wood, and that a large enough excess of glue is added to produce a layer of jelly an eighth of an inch between the two pieces. This jelly, we all know, is two thirds or more water. On setting, therefore, the water is evaporated off, leaving the one third or less of solid glue material. The evaporation of the water sets up strains and stresses in the material. The jelly contracts, draws away from the surface, and becomes contorted. Such stresses may even produce cracks in the dried glue, and a certain degree of porosity may be observed. Obviously a joint so made would show great weakness. This is an absurd case. No glue man would think of making such a joint. But assume that the jelly layer is reduced to a fiftieth, or a hundredth or an inch. Then we have conditions that are common. But the effects outlined above would still be present, and in exact proportion to the thickness of that layer. As the layer of glue between the wood pieces is made vanishingly small, the strength of the joint will approach its maximum value. The bond between the two pieces of wood should consist only of the vertical and interlaced threads of glue passing from the pores in one piece to the pores of the other.

If this is the case, and we seemed justified in making that conclusion, then it must follow that, provided the glue is properly applied, and in a condition such that a fair degree of penetration results, there can be no such an effect as a "starving" of a joint, and no such thing as too much pressure, as far as the glue is concerned. The advantageous results realized by high pressures can be explained only upon the assumption that such pressures are necessary to squeeze out the maximum amount of excess glue in the joint, and to minimize any slight inequalities in the perfection of the joint.

It should be stated that the crushing strength of the wood used sets a very definite limit to the pressure which may be applied with safety in any case. The porous types of wood will be injured by pressures which have no effect upon the denser varieties. And a thick piece of wood will stand without injury much higher pressures than could be used in thin-cut veneers.

(10). The Time under Pressure and Time of Curing.—If the pressure is removed from the joint before the glue has been given a sufficient time to harden, the two pieces will separate slightly, resulting in a weakened joint, and if the joint is broken before the glue has thoroughly dried out, the strength will be that of the partially solidified jelly, rather than of the completely cured glue. The writer finds that the pressure should be maintained for about 10 to 12 hours, and the curing for about seven days, in order to obtain the maximum strength.

(11). The Temperature and Humidity During Curing.—The rapidity and thoroughness of drying out depend in a large measure upon the temperature and humidity of the curing room. A low temperature and a high humidity make it almost impossible to obtain a perfectly cured joint. The glue, under these conditions, remains in the form of a partially dried jelly, but does not completely dry out. The opposite conditions of a warm temperature and low humidity are most favorable, both to the rapidity and the thoroughness of the curing.

Some glue consumers are in the habit of heating the joint, after it has been completed, to a rather high temperature for several hours. This practice has no advantages, as it keeps the glue in the liquid condition for a long period, and results in a much weakened product. Gill has shown that a heating of the glued blocks to 65 degrees for several hours diminished the strength very materially. This is fully corroborated by the writer's experience.

(12). The Method of breaking the Joint.—The results of the so-called strength test are usually reported in pounds per square inch, but is must be urged that the method by which the break is made is of the greatest importance. As will be shown in the following pages, the joints are made and broken in several ways. The joint may be end to end or side to side, and it may be broken by pulling apart, by shearing apart, or by applying the load at the joint, while the two ends are supported. The results obtainable vary widely. Very few results by different methods are rightly comparable, but the writer has found the observed "strength" per square inch to be about 500 to 600 per cent higher when blocks of 4 square inch area were sheared apart by pressure, than when strips of 1 square inch area were sheared apart by pulling. A standard procedure should be adopted and the method of the Forest Products Laboratory at Madison, Wisconsin,

(Continued on page 88)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.

HOFFMAN BROS. CO.

ESTABL'SHED 1867 I CORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1 Car 1/20' Red Oak (log run)
½ Car 1/16' Red Oak (log run)
½ Car 1/20' White Oak (log run)
½ Car 1/16' White Oak (log run)
1 Car 1/28' Walnut (half round)
25M 1/28' Poplar Crossbanding
5 Cars 1/8' Poplar (log run)
2 Cars 1/8' Poplar (corestock)

Prices by wire on receipt of your inquiry

HB

Reg. U.S. Pat. Off.

FORT WAYNE, IND.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

The Standard Veneer Co.

Portland, Maine

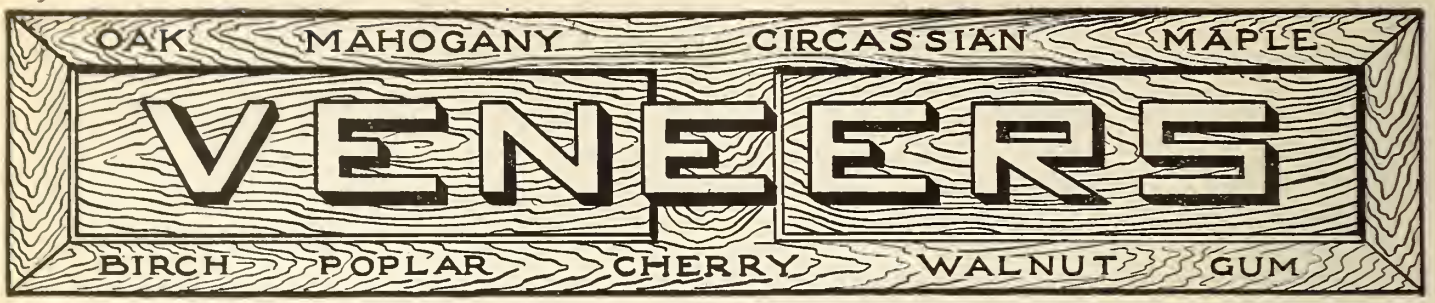
Wide Veneer

One carload of 1/20"
Quartered White Oak
Sawed Veneer
12" and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.

MEMPHIS, TENN.



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

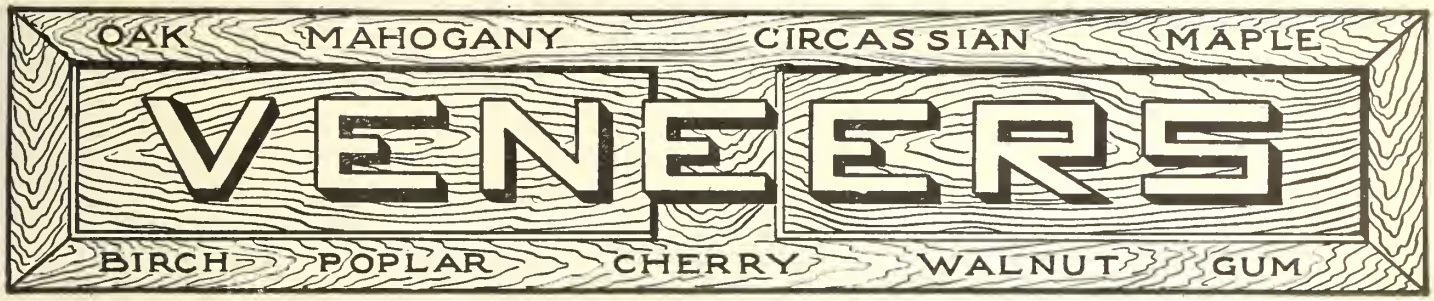
We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

May we know your requirements early ?

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Branch Sales Office in charge of George C. Hall, 610 South Michigan Blvd., Chicago, Ill.
Branch Sales Office in charge of W. R. Thompson, 318 Mead Building Rockford, Illinois
Branch Sales Office in charge of C. A. Rugg, 110 West Second St., Jamestown, N.Y.
Branch Sales Office in charge of E. V. Williams, 1219 Harrison Ave., Cincinnati, Ohio.



"Established 1884"

GUELPH PATENT CASK CO. Ltd.

Scotstown, Que.

QUALITY *SERVICE*

Our Veneers and Plywood are choice and we are fully equipped to supply the Canadian Trade.

Rotary cut Textile dried

We specialize in 1/4" and 3/16" three ply Birch Panels

Ontario Representative:

Frank Moss P. O. Box 356, **Toronto**

BUYERS OF VENEERS AND PANELS

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in this publication. They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend his time and money to get in touch with you. He deserves it—if his stock and prices are right.

Veneer Manufacturers Company

A VENEER FOR EVERY PURPOSE

PLYWOOD PANELS OF ALL KINDS

All standard sizes and thicknesses in one warehouse

For

Fine Furniture
Interior Finish
Musical Instruments
Door Stock

Right Prices ***Best Service***
Fair Terms

WATCH FOR OUR PRICE STOCK-LISTS

1036 W. 37th. St. Chicago, U.S.A.

Quality Veneers
in

WALNUT BUTTS
MAHOGANY
LONG WALNUT
BURLS · OAK · POP-
LAR & OTHER WOODS

THE WILLIAMSON VENEER CO.

MILLS - BALTIMORE, MD.

Sales-Branches: NEW YORK (709 SIXTH AVENUE) CHICAGO (28 E JACKSON BOULEVARD) HIGH POINT, N.C., JAMESTOWN, N.Y.

VIEWS OF OUR PLANT No. 11.

H.G.W.Del.

Drying—

Interior view of our unexcelled Drying Plant

Correct Drying

—a most exacting science, is necessary in the making of Veneers.
Exacting care in the operation of our Textile dryers,
assures perfect drying of our

Superior Veneers

Wood-Mosaic Company

INCORPORATED

LOUISVILLE, KENTUCKY

Representative
H. ROBERTSON
232 Lyon St., N. W.
Grand Rapids

Representative
GEO. W. STONEMAN & CO.
845 W. Erie Street
Chicago

Conditions Affecting the Adhesive Strength of Glue

(Continued from page 82)

appears to possess the greatest advantages of any that have been proposed.

(13). The Hydrogen-Ion Concentration of the Solution.—It has been shown that the viscosity, jelly consistency, swelling, and practically all properties of a gelatin vary according to the hydrogen ion concentration of the solution. A number of tests have also shown that the adhesive strength of a glue varies in a similar way, the maximum being attained at a hydrogen ion concentration in the neighborhood of PH=3.5 and 7.5, while beyond these limits the strength drops rapidly. A distinct diminution in strength is also found to follow the bringing of the solution to the isoelectric point—pH 4.7. Sherrick has observed the same tendency in the adhesive qualities of glues prepared for hectographic plates.

Creating a Profitable Market For Your Waste

A Variety of Novelties and Toys Can be Easily Manufactured From the Odds and Ends Around the Plant and Sold at a Large Profit— Little Extra Equipment is Necessary

By R. N.

In days gone by when lumber was plentiful and cheap, the question of waste gave very little trouble to the average woodworking plant. Under present-day methods of operation, however, when it has become essential that every foot of lumber used in the plant should be converted into marketable products, the situation is somewhat different.

There are millmen at the present time who will contend that it is a fallacy to try to convert the waste of the plant into useful and saleable articles. This may have been the situation in the past but the inventive genius of the woodworking machinery manufacturer, seeing the need of equipment for working up this waste, has provided machinery to convert at a profit the ordinary wood waste of any dimension into articles for which markets can be found at the present time if plain business methods are followed in this respect.

There are firms who turn out products made of wood, who will not allow their accumulation of odds, ends and offal to be used up. An effort is often made to dispose of this otherwise perfect wood by the management, but generally this results in failure due either to not coming into contact with the right parties or to prices offered which makes it more profitable to use the waste for fuel purposes.

If these firms would convert their offal and waste into marketable products themselves, they would often realize enough profit out of it to pay their entire payroll throughout the year. This, however, cannot be accomplished by trying to unload the waste on the other fellow to work up, and then continue merrily along butchering up more of it to keep him supplied. The only manner for realizing a profit out of the waste is to convert it right at the plant where the waste occurs, into merchantable products.

It is quite true your present equipment may not be suited to working up the small pieces of wood, but what of that? There are machines on the market that are made exactly for this purpose. If you invested one thousand dollars in new machinery to convert your waste into merchantable products and your sales from this source would total fifteen of twenty thousand dollars the first year, how long would it

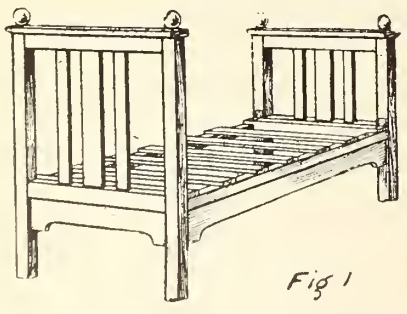


Fig 1

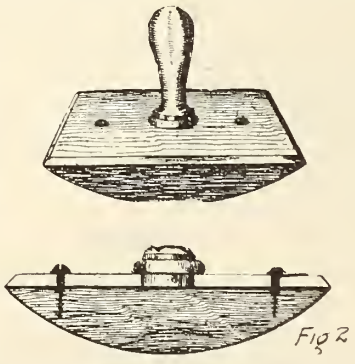


Fig 2

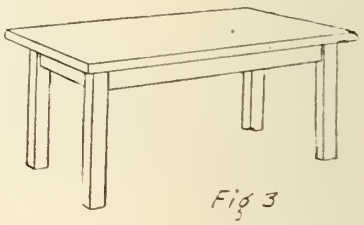


Fig 3

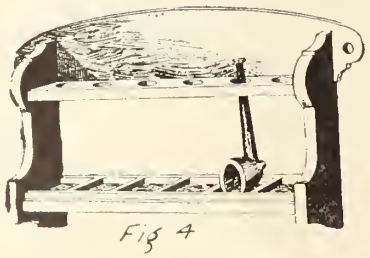


Fig 4

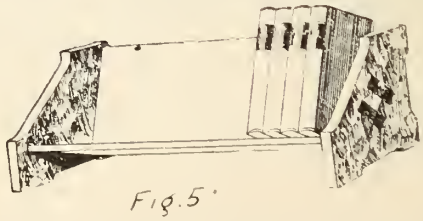
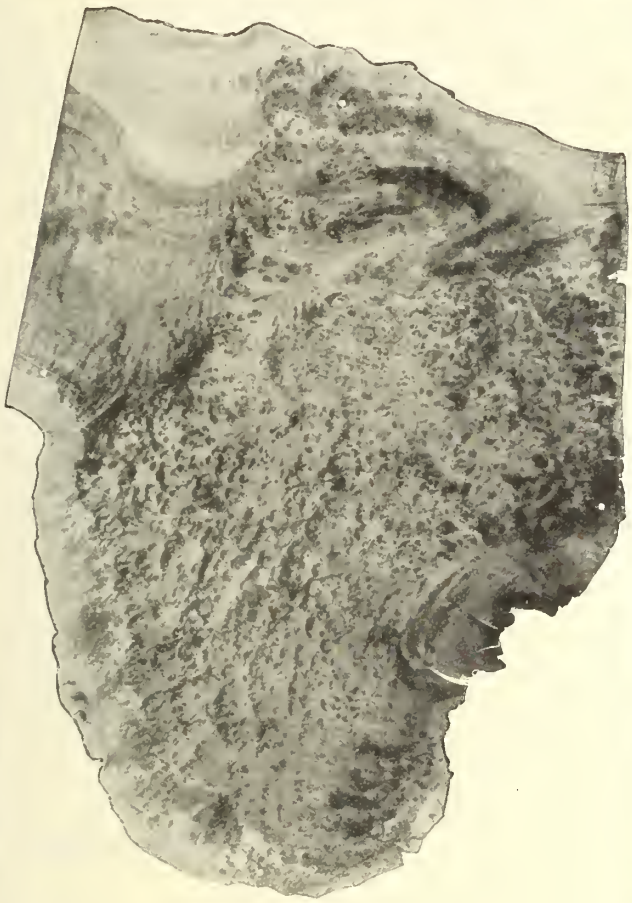


Fig. 5

These articles that sell in the stores for high prices may be made from the waste of almost any woodworking plant

C. L. WILLEY COMPANY

The **Largest Veneer Plant** *in the* **World**



AS OLIVER WENDELL HOLMES wisely said: "Knowledge and timber shouldn't be much used till they are seasoned."

Our seasoned knowledge and our seasoned samples are at your disposal. Write us concerning your requirements.

Fine woods inspire fine craftsmanship. Beautiful figures like the above, wrought into your work, will add greatly to your prestige with your customers.

Veneer & Lumber

Walnut
American and Circassian
Mahogany
Quartered Oak
English Oak
Satinwood
Vermilion
Teak
Rosewood
And Many Other Foreign and Domestic Woods

(1851)

Nature's Art

"I think that I shall never see
A poem lovely as a tree."
—By Joyce Kilmer,
a young American poet who gave his life in Flanders.

CONSIDER the sheer beauty of Willey's rare veneers. Tracery as delicate as frostwork on a window pane, designs as intricately graceful as a Moorish arabesque, can be found hidden in the heart of a tree.

Engraved by the slow-fingered years, each pattern unique as a finger-print of Father Time himself, these treasures of the woods have been gathered from far and near.

Willey's Veneer Plant has the largest existing collection of these natural art treasures from the world's forests. The inherent beauty of each specimen is revealed and enhanced in the highest degree by the work of our skilled artisans.

Willey's Veneers enrich the interiors of countless superb buildings, elegant apartments, and cosy homes. The polished and paneled background of civilization, from the Middle Ages until the present time, has been wrought from the heart of the tree.

Endless variety from which to choose the grain and texture best fitted for your special use, expert preparation and speedy delivery to supply your special need—these are features of Willey's service, which we will gladly place at your disposal.

C. L. WILLEY COMPANY

2558 South Robey Street
CHICAGO

W. T. MOORE
Sales Representative for Michigan
110 Pear Street,
Grand Rapids, Mich.

W. B. VAN
Eastern Sales Rep.
Everett Hotel,
Jamestown, N.Y.

be before this department would pay for itself? Furthermore there are hundreds of woodworkers idle to-day for want of work while on the other hand the fact has been disclosed that thousands of dollars' worth of wooden toys and novelty woodwork have been imported from foreign countries.

And why is this?—It's simply this. over there they are like the Chicago packers who lose nothing but the squeal; They lose nothing of the wood in its conversion except the whir of the saw or the hum of the planer.

To back up my contention in this regard, I will cite a few articles for which there is an almost steady demand the year round. Then if you take one of the large mail order house catalogues and refer to similar-styled articles and the prices they retail at, you will come to realize that all the profit is not always made from products that require a large volume of lumber in their production.

Take, for instance, Fig. No. 1 which represents a doll's bed made in a size 20 inches long, 10½ inches wide and 10 inches high. Its entire construction will scarcely require more than one square foot of 1-inch stock, yet the completed article sells for as high as $1.50 to $2.50. This is a product in which almost the smallest of waste can be worked up, and any kind of wood can be used. Fig. No. 2 shows a rounded blotting pad which is an item for which all those waste pieces of mahogany, walnut, etc., can be used. This article, when finely varnished and finished, retails at from $1.00 to $1.50. Fig. No. 3 is a doll's table which can be made with a small amount of work of any wood, the retail price ranging from 25 cents to $2.00 for the larger sizes. Fig. No. 4 is a pipe rack, a novelty which will find a place in nearly every home. It is made about 12 inches long and 3 inches wide and. if nicely finished, this article will easily bring $2.00 or more. Fig. No. 5 shows a book rack into which almost any kind of waste may be converted. The article will find a ready sale in the big department and book stores. The construction is simple, being generally made 18 inches long with the ends 6½ inches wide and 6 inches high. This article may be easily retailed at from $1.00 to $3.00, and every home in the country is a possible prospect for sale.

Thus, a whole array of articles could be shown which, with the addition of one or two machines to your plant, could be produced from the so-called waste at a good profit.

School Furniture by St. John Firm

Lordly and Son, St. John, manufacturers of furniture are busy at their St John, N. B., factory on an order for school desks for the St. John Board of School Trustees. These desks will be used in the new school being constructed in West St. John. This firm and Son have manufactured sixty per cent of the school furniture used in the St. John schools. They are also competing favorably with upper Canadian firms in the sale of showcases in St. John and adjacent territory. They now have a factory in the south end of St. John.

Emery's Furniture Works, Charlotte Street, St. John, N. B., have secured more floor space than formerly held in the Charlotte Street quarters, and have installed additional machinery. The factory has been in existance for many years, and business at the present stage is exhibiting a decided improvement. Tables, chairs, school desks and other items of school furniture, are manufactured.

This photograph was taken of our exhibit at the Indianapolis Industrial Exposition held in Indianapolis last fall, which was attended by more than 150,000 people. Our exhibit was pronounced the finest display of Hardwoods and Veneers at the exposition.

WE HAVE THE FOLLOWING VENEERS READY FOR IMMEDIATE SHIPMENT:

1-20" Qt. Sawed White Oak
1-16" Qt. Sawed White Oak
1-8" Plain Sawed Red Oak
1-8" Cherry
1-8" Walnut
1-28" Walnut Sliced

2,000,000 Feet of Indiana Hardwood Lumber

F. M. Bachman Co., Indianapolis, Ind.

TORONTO HARDWOOD LUMBER COMPANY LIMITED

(Formerly Lumber Dept., Toronto Veneer Co. Ltd.)

Head Office:
1100-1104 Queen St. W., TORONTO. Phone Park, 6980
Yard: Atlantic & Hanna Aves. Grand Trunk Ry. Toronto.

Montreal Office:
424 Power Bldg. Phone Main 8725
Saw-mill: Louisville, Ky.

Walnut	Gum	Birch
Mahogany	Cottonwood	Basswood
Yellow Poplar	Sycamore	Beech
White Oak	Cypress	Maple
Red Oak	Yellow Pine	Elm
Chestnut	Tennessee Red Cedar	White Ash

....Ample and well assorted stocks of above always carried in Toronto. A fair stock of kiln-dried Hardwoods carried in stock. Can make shipment at a moment's notice.

As a means of conserving your capital, why not try our mixed carload service from Louisville mill. No extra charge for including any number of items in one car. Can kiln-dry at Louisville.

We ask the privilege of figuring with you on your requirements.

OUR SPECIALTY—INDIANA FORKED-LEAF WHITE OAK.

Quality Hardwoods at Fair Prices

An unchanging high standard is your assurance of the utmost in Quality and Service when buying

PANELS LIMITED

Southampton - - - - Ontario

TOPS
CASE GOODS
FLUSH VENEER DOORS
3 AND 5 PLY PANELS
3 AND 4 PLY TABLE RIMS
5 PLY RIM BOUND TABLE TOPS

On hand for Immediate Shipment:
Stock Panels in Mahogany, Walnut, Oak, Birch, Etc.,

Sizes	24 x 60	30 x 60
	24 x 72	30 x 72

Selling Agents:

Toronto Veneer Co., Ltd. 1100-1104 Queen St. W. Toronto

Business Paper Fundamentals Taught by Daily Newspapers

GLANCE through the pages of any great Daily Newspaper and notice how it tends toward Business Paper practice.

Here is a building section, there an electrical department, again columns of interest to wholesaler, a lumber page, a theatrical page, a sporting page—and next to each you find the advertising relative to the subject in question.

Watch the reader turn to the department in which he is most interested—where the advertising is to be found which will be most likely to appeal to him. So with the business man—as a time-saver, he takes up his business paper to learn the latest developments in his special field. Other publications have but a casual interest for him—because they broaden his general knowledge or afford mental relaxation—but it's the business publication he desires, and requires, when he's thinking of business only. He knows that the business paper will give him the very facts he needs—briefly and **reliably**—in both editorial and advertising pages.

To advertise in business publications places your products before such business men at a time when they're thinking of business.

Lowest Rate Per Interested Reader

Hugh C. MacLean Publications

Electrical News
Canada Lumberman
Footwear in Canada

Canadian Woodworker
Western Contractor and Builder
Contract Record & Engineering Review
Commercial & Retail Merchants' Review

Furniture World
Western Lumberman
Western Coal Review

Head Office : 345 West Adelaide Street

Vancouver Chicago Toronto Montreal Winnipeg

The largest publishers of technical papers in the British Empire, printing in Toronto, Winnipeg and Vancouver. Proprietors of MacLean Building Reports Limited.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

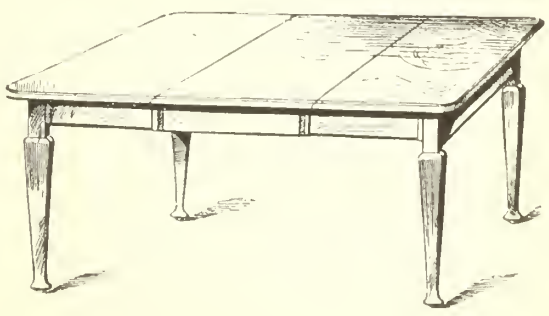
VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

GOOD Plywood is only produced by using first class materials; properly constructed, by careful and skilled workmen.

Our panels are made in this way. Panels in Maple, Birch, Plain Oak, Qrt. Oak, Walnut, Mahogany, Gum, etc., in standard sizes or made to order in quantities.

Flush Veneered Doors in B.C. Fir, Georgia Pine, Plain Oak, Qrt. Oak, etc.



Write for catalogue and prices.

HAY & CO., Limited Woodstock, Ont.

How Case Hardening Was Overcome

An Electrical Concern Using Air-Dried Lumber Experienced Trouble Due to Case Hardening Which Was Satisfactorily Remedied by Seasoning the Stock in a High Humidity Dry Kiln

A large manufacturing electrical concern purchased a quantity of quarter-sawed red oak which was to be used in one of their products. This was the average air-dried lumber—that is to say, the wood was dried in the open by the natural atmosphere. It was found, however, that the finished electrical device was very erratic in operation and that there was considerable distortion. On investigating, it did not take very long to find the trouble. The lumber used showed a very poor condition of drying. Samples were then taken by experts and laboratory tests were made. To make such tests, the wood is usually cut roughly like a tuning fork.

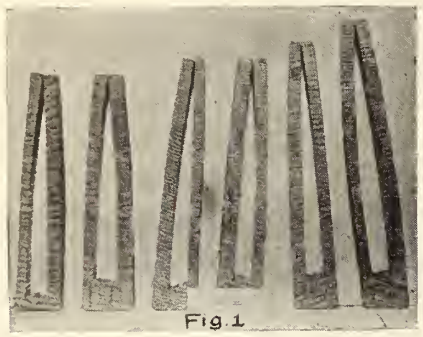


Fig. 1 —Case hardening is indicated by the closed prongs

Figure 1 shows what happened to the testing samples after being left in the laboratory for a few days. The samples were cut from the lumber exactly as it was delivered from the mill. It will be noticed that in every instance the tines of the fork closed together at the top. The cause of such distortion is what is known as "case-hardening."

When any kind of lumber, whether red oak or not, manifests this condition, it is indicative of overdrying of the surface of the wood, the inner portions hardly being affected at all. Case-hardening will, in every instance, curve the test fork towards the top. This is due to the unequal stresses of the lumber which is dried to hardness on the surface, yet hardly fit for use immediately below.

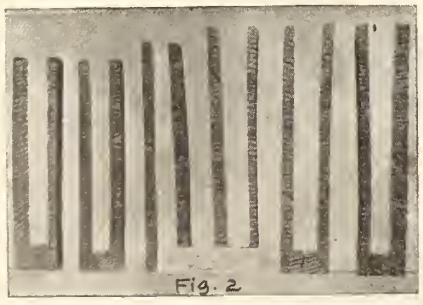


Fig. 2—Case hardening cured by proper kiln drying

Case-Hardening Overcome

With all this lumber on hand, the electrical concern had to do something to remedy conditions. Usually, case-hardening lumber is somewhat hopeless of recovery but the wood was put into a well-known high humidity dry kiln to see what benefit could be obtained. The result was not only gratifying but indeed surprising. Figure 2 shows the same samples after they were taken out of the kiln showing the tines approximately parallel. This is correct and normal condition of test samples of properly dried and seasoned lumber.

As the samples showed up so well, all the lumber was put into the kiln. From time to time, tests were again made and in every instance, it was found that this dry kiln was able to rectify a rather bad example of the case-hardening of wood. The electrical company was, therefore, able to use the wood which naturally saved the concern a good deal of money, as the lumber was purchased as air-dried stock which in reality it was.

The saw-mills can hardly guarantee the condition of lumber, but they can promise that any particular lot has been left out in the air for several months. What the wind, weather and sun does to it can not be controlled by the seller.

The buyer sometimes takes a chance and for all ordinary purposes, the air-dried stock is plenty good enough. But where special care must be exercised as in electrical apparatus, the lumber must be free from all danger of warping, shrinking or swelling.

Woods Used for Turning

In selecting woods for lathe-turning purposes, the nature or use to which the object turned is to be put, appearance of the finished product and the ease with which it may be worked are prime requisites. To illustrate this thought: Maple is ordinarily used for turning tool handles; poplar and hard maple for household articles, such as potato mashers and rolling pins; pine, gum, and poplar for glove and stocking darners; hard maple for rammers and mallets; maple, cherry and gum for dumb-bells and Indian clubs; mahogany, cherry and walnut for gravel heads and handles; any soft wood for rosettes; poplar and cherry for pin trays; cherry and birch for card receivers; woods that take polishes for desk trays; maple and birch for bread plates; close-grained wood for sewing rings and towel rings; close-grained hardwoods for round picture frames and napkin rings; maple, mahogany and cherry for artistic boxes; white pine for rope pulley patterns and patterns of other descriptions; cherry, mahogany and redwood are also generally used in pattern making, although white pine leads the class; poplar for turning when followed by considerable bench work; gum and walnut for ring stakes and jewel trays; mahogany for low stools, candle sticks, floor lamps, etc.

Old fashioned virtues still bring substantial rewards. For instance, another man has been discovered who made his fortune by attending to his own business.

The Sidman Lumber Curing Process

IN

Remodeled or new, Wood, Brick or **Concrete** Buildings.

Fillers and glazes to preserve the building.

The TAG-ROESCH **Automatic** Time-Temperature and **Humidity Controller.**

Three-ply and Du-o-fold Army Duck Curtains, and Hussey Door Carrier Doors.

Automatic Heating, Ventilating and Humidity Systems for Varnish Rooms.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Sidmans AUTOMATIC **Suction System** for returning ALL Condensation DIRECT to the Boiler.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-Down Draught Vent Heads for all purposes.

Cleanable Screen Panel and Window Ventilators.

Roller Bearing (Ott) **Channel Iron** Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and The Sidman Special Hygrometers.

For Description and prices, write

The

Sidmans of Canada

Heating and Ventilating Engineers and Lumber Curing Specialists

LONDON **ONTARIO**

Space does not Permit listing all of our

Hardwoods

but below are some Special Items

1 car 4/4" No. 1 Com. & Btr. Basswood.
1 " 5/4" No. 1 Com. & Btr. Basswood.
2 " 5/4" No. 2 & 3 Com. Basswood.
2 " 4/4" No. 2 Com. & Btr. Soft Elm.
2 " 8/4" No. 2 Com. & Btr. Soft Elm.
3 " 4/4" No. 1 Com & Btr. Birch.
1 " 5/4" No. 1 Com. & Btr. Birch.
1 " 8/4" No. 1 Com. & Btr. Birch.
2 " 12/4" No. 1 Com. & Btr. Hard Maple

Thoroughly dry and can be shipped quick.

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 514 Canada Cement Co., Bldg.

Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

The Lumber Market

Domestic Woods

There seems to be a well-defined impression in manufacturing circles that hardwood lumber may be scarce next spring. Stocks in several lines are none too plentiful and those who have quantities on hand are holding out for comparatively high prices. The demand for maple at the present time is particularly active and the inquiries that are coming to hand for various other woods indicate that woodworking establishments and wood-consuming industries are entering the market for supplies and preparing for the renewal of activity which is apparently at hand.

There is a quiet confidence that the hardwood situation, which has grown firmer during the past month, will continue to develop in strength and volume. It is admitted that the complete rehabilitation of the industry has been delayed first by the coal strike and later by railway shop crafts' disputes, causing car congestion at many points, embargoes at others and a slowing up of distribution processes generally. Agricultural implement firms are now operating, piano manufacturers are getting busier, the better class of furniture is moving more freely, and automobile concerns were never rushed in September as they are this month. All this means continued activity in the hardwood arena.

One complaint heard from producers and wholesalers is that the low ends of certain woods are difficult to dispose of, in fact are a drag on the market. It is likely, however, that some avenue will be found in the near future whereby No. 3 common may be employed.

Shipments of Canadian hardwoods to the other side have been quite heavy of late and stocks of birch and maple are moving. The continued building boom in larger centres is causing a certain amount of interior trim to be called for. Other projects in the building line which have been held in abeyance awaiting the outcome of the abundant harvest, will now proceed. Hardwood flooring manufacturers have been exceptionally busy, some of them reporting that last month was the largest in their history.

With the resumption of transportation facilities, it is expected that the hardwood trade, which the strikes have retarded to some extent, will soon find its natural flow on account of the outward movement of manufactured lumber being more or less restricted for some weeks. With big consumers the demand has continued as they were evidently not willing to take chances on a serious tie-up. The market has been searched for stock and nearly everything suited for their requirements has been corralled. In most cases buyers have demanded that shipments be made immediately.

Imported Woods

As we go to press the lumber market in the United States is featured by a very satisfactory demand in most centres but very unsatisfactory shipments owing to the car shortage coming in the wake of the railroad strike. The problem of hardwood manufacturers for some time to come is that of production and distribution. A shortage of flat cars is preventing the transportation of logs to the mills, and in some cases mills have closed down altogether because of inability to secure logs. Because of the doubtful transportation, logging itself is slowing down in some centres, which not only affects the immediate supply but also the supply some time hence. The logging firms which depend on water or their own logging equipment for transportation, have little to fear, but those that are dependent on the public carriers are receiving extremely poor service.

The curtailment of transportation facilities is also affecting the distribution of lumber from the sawmills, and were it not for that, the mills would be able to dispose of all the stock they could manufacture as the demand appears to be quite considerable in extent.

Prices seem to be holding firm with a slight tendency upward on account of the difficulties in filling orders. The hope of the hardwood manufacturers is that an early settlement of the railroad strike will enable them to cope with the demands that are coming in and thus sell at prices no higher than those which have been prevailing for some time.

Memphis, Tenn.—Reports from this centre indicate that demand is steadily increasing and that the volume of business in hardwood lumber will be limited only to the available supply of lumber and the available supply of cars. All firms engaged in the hardwood business in this territory are finding plenty of orders for all the lumber they have ready for delivery, but they are seriously handicapped in meeting the demand by the pronounced shortage of cars. Flooring manufacturers are very active and are using quite a great deal of No. 1 and No. 2 common oak, while other building trade interests are buying in fair volume though, perhaps, not quite as heavily as recently. Some furniture manufacturers are stocking up lumber and automobile firms are buying fairly heavily in certain lines. The export trade is reported to be greater than at any other time this year.

Louisville, Ky.—The hardwood demand in the Louisville territory appears to be fairly active although many operators are not able to accept new business or promise anything in the way of delivery. Stocks that are available are being rapidly picked up but there is a tendency to wait on the part of some buyers until the strike situation clears itself. Prices are reported to be quite firm with a tendency to go a bit higher.

Evansville, Ind.—Trade would be very satisfactory but for the railroad strike that has created a car shortage. When this impediment is settled it is felt that business will resume on a very active scale. Lumbermen say that the whole state of the fall and winter business now depends upon how soon the strike of the railroad shopmen ends. Few of the large hardwood mills are being operated at this time. Stocks are low in many sections which leads to the belief that after the demand for lumber picks up, there will be a gradual increase in prices.

Victor Woodworking Company of Amherst, N.S., has been conducting an intensive advertising campaign in the maritime newspapers, and this has resulted already in an improvement in business. This concern manufactures floorings, doors, sashes, tables, sheathing, clapboards, ornamental woodwork of all descriptions. This firm also manufactures cabinets, having a planing mill and cabinet factory at Amherst. Church, bank and school work are especially catered to.

QUALITY *SERVICE*

In Canadian Hardwoods

Kind you want

Impressive quality

No better manufactured

No kick

On grades

Now is the time to order a sample car

THE

Kinnon Lumber Co.

LIMITED

454 King St. W. Toronto

New and Used Woodworking Machinery

We can save you money—look over our partial list and if you do not see your requirements —Write, wire or phone us.

	SHAVING EXHAUSTERS	
50"	American Blower Co., 16" Outlet	$ 75.00
48"	Foster Ball Bearing 18" Outlet	100.00
40"	Keith 15" Outlet	50.00
	MOULDERS	
7"	4 Sided Goldie McCullough	350.00
7"	3 Sided Cowan & Co.	275.00
12"	4 Sided Cowan & Co.	650.00
	SHAPERS	
2	Spindle	100.00
1	Spindle	85.00
	SANDERS	
	Pattern Maker's Disc & Drum 18"	75.00
131	Mattison Belt Sander 8' Table	350.00
	PLANERS	
24"	Major Harper Poney Planer	175.00
30"	x 12" McGregor Gourlay Double Surfacer	1250.00
24"	Buzz Planer No Fence	100.00
16"	Buzz Planer No Fence	50.00
12"	Buzz Planer Complete	100.00
	MORTISERS	
	Cant Brothers Galt	75.00
	LATHES	
12"	Pattern Maker's Iron Bed	75.00
	SAWS	
	Trim and Rip Saw	125.00
26"	Cant Gourlay Pedestal Band Saw	100.00
42"	Jackson Cochrane Band Rip	250.00
	Famous Swing Saw with Table	100.00
	Elliott Woodworker 1-½ Wagner Motor	180.00
	Elliott Jig Saw	35.00

GENERAL MACHINERY CO.

67-69 Frederick St., TORONTO

TELEPHONE MAIN 2200W

The Peter Hay Knife Co., Ltd.

Manufacture the Best

PLANER KNIVES and CUTTERS

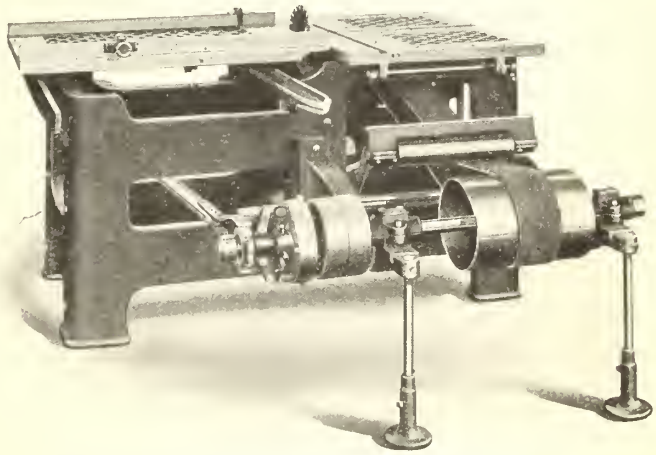
OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited

GALT, ONTARIO

DEPENDABLE MACHINERY

For Your Wood Mill



No. 22 Large Bevel and Mitre saw

A most valuable machine in all automobile, carriage, furniture, door and woodworking factories.

Massive frame—adjustable table—saw can be raised or lowered to any angle up to 45 degrees. Perfect working in every detail.

WOOD-WORKING MACHINES

No. 19 Small Saw Tenoner.
No. 20 Large Saw Tenoner.
No. 21 Regular Bevel and Mitre Saw.
No. 22 Large Bevel and Mitre Saw.
No. 23 8½-in. Irregular Dresser
No. 24 6-in. Irregular Dresser stock clamps

Woodworking machines equipped with direct motor or belt drive.

METAL MACHINES

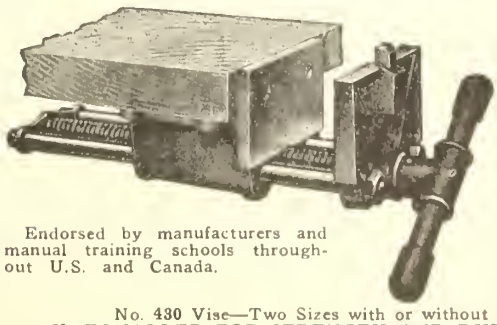
Large Automatic Power Hammers (For body panels and all other metal work.)
Metal Trimming Cutters.
Rotary Cutters.
Metal Rollers or Formers
Small Automatic Power Hammers (For body panels and all other metal work.)
Power Beaders. Foot Presses.

$

Write for catalogue

PETTINGELL MACHINE CO. Amesbury, Mass.

Quick as a Cat - A Hold like a BullDog



Endorsed by manufacturers and manual training schools throughout U.S. and Canada.

No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

No. 430 Vise—Two Sizes with or without stop

UNEQUALLED FOR STRENGTH AND DURABILITY

Our Complete Catalogue on Request

RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.

News of the Trade

Goderich Art Craft Furniture Company, Ltd., Goderich, Ont., will shortly instal a dry kiln.

Marbo Pipe Company (Canada) Ltd., Montreal, was recently incorporated to manufacture and deal in cigar boxes, pipe cases and other wooden containers. Capital $50,000.

The St. Lawrence Wagon Company, Ltd., King St., Montreal, was recently visited by fire, which resulted in a loss of $6,000.

A. H. Koepke, Kitchener, Ont., is contemplating the building of a planing mill on Lancaster St., at a cost of about $7,000.

Keith Electric Refrigerator Co., Ltd., Toronto, have been incorporated with a capital of $100,000 to manufacture and market refrigerators.

National Polish Company, Limited, Toronto, have been incorporated to manufacture and deal in all kinds of polishes, with a capital of $75,000.

Plans are being prepared for the erection of a new Industrial and Vocational School at Weston, Ont., to cost $115,500.

The Acme Sash & Door Company, Ltd., St. Boniface, Man., have been awarded the millwork contract for a new school to be built at Winnipeg at a cost of $30,000.

Durant Motors of Canada, Ltd., Leaside, Ont., are putting in the foundations for an addition to their auto plant to cost $750,000.

The Grey Furniture Company, Neustadt, Ont., are preparing plans for the building of an addition to their plant at a cost of $10,000. Additional machinery will be necessary.

The planing mill of Silliker & McMann on Windsor St., Halifax, and operated by C. B. McMann, was desroyed by fire with a loss of $15,000., partly covered by insurance.

R. A. Sproule, Beechwood Ave., Ottawa, recently secured the furniture contract for the new Ottawa Collegiate, which will cost $700,000.

International Shoe Heel Corporation, Aylmer, Ont., are contemplating the purchase of a factory building where they will likely instal new equipment.

Alterations to the factory of the Goderich Art Craft Furniture Co., Ltd., Goderich, Ont., are to be undertaken, a dry kiln being one of the facilities to be installed.

Premier Phonograph Company, Ltd., Toronto, have been granted a provincial charter to manufacture and deal in phonograph cabinets and furniture. Capital $40,000,

Graves Bigwood & Company, Bank of Hamilton Bldg., Toronto, who lately suffered a heavy fire loss at Byng Inlet, Ont., are contemplating the erection of a box factory at that point.

North American Snow Shoe & Mfg. Company, Sault Ste. Marie, Ont., have recently opened a plant for the manufacture of snow shoes, skis, toboggans. A wood cutting machine will be needed.

Dodge Bros. Motor Company of Canada, Ltd., have purchased a site at Sandwich, Ont., bounded by the C. P. R., Jeanette Ave. and Pelissier St., where they are expected to erect a plant.

The Interior Hardwood Company, 72 Wilmott St., Kitchener, Ont., was recently awarded the contract for science room furniture for the new Scarboro township high school, York County.

Warren Manufacturers, Saskatoon, Sask., were recently awarded the millwork contract for the new collegiate institute. The new building will cost about $126,000 and is being built by the school board of Saskatoon.

Refrigerating Engineers, Limited Montreal, were recently granted a federal charter, with a capital of $50,000, to take over the Frick Ice & Refrigeration Company and to manufacture and market refrigerators of all kinds.

Ford Company of Canada, Ltd., Ford, Ont., are preparing plans for the erection of a new automobile plant on Danforth Ave., Toronto. The building will cover five acres and the dimensions will be approximately 400 x 500 feet.

Andrew Gray Company, Limited, Toronto, have been granted a federal charter to take over the Andrew Gray Company, Limited, Owen Sound, Ont., and to manufacture and market all kinds of furniture. Capital $50,000.

Canadian Ruler and Wood Advertising Novelty Co., Limited, Toronto, have recently obtained a federal charter to manufacture and market all kinds of wooden novelties. Capital $100,000.

Frank E. Windsor, manager of the London, Ont., branch of the Nordheimers Piano and Music Co., for fourteen years and recently connected with William McPhillips, Ltd., has been appointed manager of Heintzman and Co., at London.

Geo. Lebel, 201 Baby St., Montreal, was awarded the millwork contract by the Catholic School Commission, North Dist., for their new girl's school and residence, to cost $180,000.

Buist McIntosh Company, Ltd., Orillia, Ont., have been incorporated to acquire the business of Buist and McIntosh and to make and sell refrigerators, ice cream cabinets tubs and other wooden storage equipment. Capital $50,000.

The Canadian Pipe Company, Vancouver, B. C., are contemplating the erection of a new wood pipe factory which will cost $35 000. The old plant was recently destroyed by fire.

The Montreal Pattern Works, 242 Clark St., Montreal, Que., have added to their plant, and are now turning out store fixtures, wood turning and carving as well as furniture repairing.

Morin & Tremblay, Limited, Roberval, Que., were lately incorporated to manufacture and market all kinds of wooden boats. Capital $49,900. R. Morin and E. E. Tremblay, manufacturers, both of Roberval, Que., are two of the incorporators.

The Henry Wise Lumber Co., of St. Catharines, Ont., report that they have had the busiest year so far in the history of the firm and believe that trade will continue to be satisfactory especially if the farmers get a good price for their produce.

Canadian Sidway Company, Ltd., Toronto, has been granted a federal charter to manufacture and market push carts, sleighs, carriages and all kinds of children's vehicles. Capital $165,000. Frank R. Hodgins of Toronto is one of the incorporators.

In a letter to the Board of Trade, Woodstock, Ont., the Brunswick-Balke-Collender Company recently notified the city council that they would not locate their Canadian headquarters in Woodstock. The statement is a disappointment to the city, which has in the last three years spent large sums of money in securing property for the proposed plant.

Riviere-du-Loup Auto Co. Ltd., Riviere-du-Loup, Que., were recently granted a provincial charter with a capital of $50,000, to manufacture wagons, carriages, automobile bodies and other wooden vehicles. Two of the incorporators are A. Berube and Joseph Mercier, both of Riviere-du-Loup.

Bromsgrove Guild of Canada, Ltd., Montreal, have been awarded the contract for the furniture equipment of the

Uniform Lumber Means Greatest Satisfaction To The User!

You no doubt have experienced the expense, loss of time, and loss of materials, caused by the use of improperly cured, wrongly graded, and carelessly handled hardwood.

Kraetzer-Cured Lumber is absolutely uniform in quality, properly graded, and every board plainly marked, showing the grade. To show our faith in Kraetzer-Cured products, every board is stamped with our brand.

THE KRAETZER-CURED LUMBER CO.

Because of our unusual facilities we control the lumber from the virgin growth to the time it is loaded on the cars and shipped to you.

When you have once used Kraetzer-Cured Lumber you will not be satisfied with the ordinary kind. Read the eight important reasons why Kraetzer-Cured Gum is used by thousands with such satisfactory results. It will give the same results to you.

Kraetzer-Cured Lumber is of the very best quality, carefully handled by all departments. Every step in this process is taken with the idea of producing uniform high grade hardwood that w ill give maximum service in your hands.

In addition to Kraetzer-Cured Gum, we can furnish Oak, Ash and other Southern Hardwoods.

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorehead, Miss. Leflore, Miss.

You Should Use KRAETZER-CURED GUMWOOD *Because:-*

1. It is STRAIGHT and FLAT, free from the warp and twist usually encountered in untreated stock.
2. It is BRIGHT and will satisfactorily take any finish.
3. It is free from dote or rot—the sap and gums are eliminated by the steaming process, and fermentation and decomposition are thus prevented.
4. Through the elimination of stain and decomposition, it possesses greater strength and longer life.
5. It contains only atmospheric moisture, enabling it to be used for many purposes without kiln drying.
6. When kiln drying is necessary, this can be done in much less time and with more satisfactory results.
7. It is uniform and dependable. One car like another, grade and measurement what it should be—no time w a s t e d in reporting complaints or shortages, no delays or interference with factory schedules because of holding lumber for adjustments.
8. It is the most economical lumber available. It will satisfactorily answer any requirements expected of materially higher priced woods. Join our little army of satisfied users, and just as peace is about to supplant war, let peace of mind take the place of the warfare and worries that usually beset the user of lumber.

We're proud of this product —that's why.

new bank building to be erected for the City & District Savings Bank, St. James St., Montreal. Alf. Mercure & Fils, Montreal, have secured the millwork contract for the same building.

Walker Company, St. Thomas, Ont., is a new concern incorporated to manufacture a liquid glass finish for finishing furniture. The company is busily engaged organizing its sales territory. The headquarters are in the Spohn Block, Talbot St. West.

J. Crawshaw, of the Amherst Cabinet Works, Amherst, N. S., has accepted the position of woodworking instructor in Sackville at Mt. Allison. Mr. Crawshaw was owner of the Amherst Cabinet Works, which business will now come to a close with his departure from Amherst.

The proposed regulation of the railway commission in ordering that all cheese boxes be wired is meeting with a storm of opposition from many interested parties. It was stated by the Brockville Board of Trade that if the regulation took effect it would add 16 cents to the cost of each box.

Sonora Phonograph, Limited, Toronto, have been granted a federal charter to manufacture and market phonographs and other musical instruments. Capital $40,000. E. D. Coots, of New York City and I. Montagnes, of Toronto, are two of the incorporators.

The Art Craft Furniture Company, Goderich, Ont., a recently organized furniture manufacturing concern, is remodelling an old factory and installing some new machinery equipment. The company is also interested in prices of raw materials in quantity.

W. A. Murphy, of Norwood, Ont., recently started a retail lumber yard and sash and door factory. His plant is well equipped for producing woodwork of all kinds. Mr. Murphy reports that business with him has been very good so far this season.

The Gun-son-ola Company, Limited, Wingham, Ont., have been granted a provincial charter with a capital of $150,000 to take over the business carried on by William Gunn and to manufacture and deal in musical instruments and furniture. W. Gunn and C. Gunn, both of Wingham, are two of the incorporators.

Mr. Thos. Burridge, of Brockville, Ont., who is well known in woodworking circles, has recently opened a woodworking plant equipped to manufacture camp stools, kiddie cars, hand sleighs, rocking chairs and toys of every description, also chesterfield frames and chairs and cabinet work of all kinds.

The Brantford Novelty Company's plant, Brantford, Ont., recently suffered a loss of $1,500 when their building took fire. Much machinery and unfinished work was damaged owing to the inflammable character of the materials manufactured. The plant was very busy at the time and the delay will cause considerable loss.

Steven & Groff Lumber Co., Beamsville, Ont., was recently incorporated to manufacture and deal in all kinds of builders' supplies. Capital $40,000. J. A. Stevens and E. G. Groff, both of Beamsville are two of the incorporators.

Piggott Lumber Co., Windsor, Ont., have started excavation for a two storey brick addition to their lumber shed at a cost of $5,000.

The Hayes Wheel Company of Canada, Ltd., Windsor, Ont., according to a statement made by manager R. B. Craig, will shortly co-ordinate their operations in Chatham, Ont. Mr. Craig stated that formerly the wooden part of the Hayes wheel was manufactured in Chatham, but this plant will be moved to Windsor where the two sections of the company will be housed under one roof.

The Preston Woodworking Machinery Company, Ltd., of Preston, Ont., brought out an interesting little folder recently, gotten up especially for distribution at the Canadian National Exhibition in Toronto, which illustrates several of the company's extensive line of woodworking machines, including planers, shapers, band saw, rip saw, tenoning machine, moulder, saw and jointer guards, motor driven cut-off saw and swing saw, saw tables, boring machine, lathes, jointer, etc.

A. McN. (Sandy) Staples, for the last sixteen years head of the retail department of R. Chestnut & Sons, canoe and sports goods manufacturers, of Halifax, has severed his connections with that firm and will become representative in Nova Scotia and Newfoundland for P. W. Bird and Son, building material manufacturers of Hamilton, Ont. Mr. Staples was presented with a handsome amber pipe by the members of the staff. The firm of R. Chestnut & Sons, through W. T. Chestnut, managing director, expressed appreciation of Mr. Staples' services and presented him with a parting gift.

Haley and Son, St. Stephen, N. B., which firm also operates a mill on the Maine side of the St. Croix river at Calais, have been manufacturing automobile bodies of late in addition to the sashes, doors, tables, flooring, etc., recognized as products of the St. Stephen factory. Haley and Son have been advertising considerably for some time and business has been increasing in volume each year. Alterations and additions have been made to the St. Stephen factory to cope with the increased business. Harry Haley, the manager of Haley and Son, is one of the leading citizens of St. Stephen and is active in the affairs of that border community. He is a keen follower of sports and an incurable adherent of harness racing. Mr. Haley owns several horses and nothing pleases him more than to leap into the sulky and drive his speedy equines around the track at St. Stephen in a race or practice spin. He has won a number of races and finished well up with the winner in others.

The plant of the Christie Woodworking Company, Limited, Erin Street, St. John, N. B., is being operated steadily and by an enlarged crew of men. This firm is employing more men now than at any time during the past few years. At the present time the company is conducting an intensive advertising campaign in behalf of its products, newspapers, programs and circulars being utilized to present the case of the concern before the public. The Christie firm is one of the oldest woodworking manufacturing industries in the maritime provinces. The industry was started on City Road in St. John sixty years ago. Ten years ago, the plant was burned, and the firm rebuilt but after operating for two years removed to the Erin Street location. The City Road property is retained by the firm for the storage of lumber. The Erin Street factory was built seventy years ago, at the corner of Erin and Brunswick Streets, on the Courtenay Bay freight branch of the Canadian National Railways. It was originally built by Scott and Lewton, one of the pioneer woodworking firms of the maritime provinces. This firm went into the discard, about fifteen years ago, and the property was purchased by the Christie Woodworking Company, Limited. The location is an advantageous one.

Obituary

Joseph Lamarche, Montreal, for many years engaged in the sash and door business, died recently at his home on Hartland Ave., in his 73rd year.

John Fair, Arthur, Ont., who for many years conducted a woodworking business at Arthur, recently passed away. As a boy the late Mr. Fair came to Canada from Ireland and learned the wagon making business. He always took a great interest in the affairs of his town and his passing is mourned by a wide circle of friends.

The Sturtevant story is in the last paragraph of this letter; but read the whole of it—it is mighty interesting

Syracuse Blower Company

EXHAUST FANS, BLOWERS, DUST COLLECTORS
FURNACE FEEDERS :::::::: DUST ARRESTORS

MECHANICAL EXPERTS IN THE MANUFACTURE AND COMPLETE INSTALLATION OF DUST COLLECTING, VENTILATING AND HIGH PRESSURE SYSTEMS

SYRACUSE. N. Y. June,5,1922.

B.F.Sturtevant Company,
Roston,Mass.

Attention -Mr.H.M.Nichols,
M'g'r-Convey'g & C.I. Fan Dep't.

Gentlemen:-

The writer has just returned from the Webster Furniture Company,Inc, Rochester,N.Y.and wish to advise that the 70" and 35" electric steel plate planing mill exhausters arrived in due time and we have everything ready and connected.

We wish to taank you for the prompt service and the manner in which you handled this shipment and we asure you that we appreciate it very much.

The design and workmanship of your apparatus is A #I.and in the writers' opinion can not be beat. It is a pleasure to sell such equipment for I asure you that I feel rather proud of this job.

We followed your instruction in re-assembling the 70" planing mill exhauster and we got this so we could spin the fan wheel with one finger ,they did not have the motor wired so we could try it but they will have in a day or two.

All the fans that you have furnished since we started in business have given us no trouble we have never heard a complaint from any of the customers but all have pronounced it " a perfect job " ,

The customers do not hesitate to pay more money for your apparatus after it is proven to them that the design, construction and engineering is A #I.

Thanking you again for past favors, we are

Yours very truly
SYRACUSE BLOWER COMPANY,
By- J. C. Gowits

JCR-M

Sturtevant PUTS AIR TO WORK

B. F. Sturtevant Co. of Canada Limited
Montreal Galt Toronto

Territorial Representatives:
Empire Engineering & Supply Company, Edmonton, Alberta
Kipp-Kelly Limited, Winnipeg, Man

669

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

Used Woodworking Machines

Are you looking for a used machine? Look over this list. If any of these machines interest you, don't hesitate to write for further data. It will be worth your while.

1—Band Rip Saw—42" x 3".
1—42"—3 Drum Sander, rebuilt.
1—30" Single Cabinet Surfacer, rebuilt.
1—Two spindle oscillating Sander.
1—6 Ft. Hollow Arm Sander, good as new.
1—10" Sticker.
1—48"—3 Drum Sander.
1—8" Sticker.
1—3 side Planer and Matcher—15".
1—Double End Tenoner.
1—30" Single Surfacer.
1—Yates 43" Endless Bed Sander, rebuilt.
1—6 Ft. Swing Saw.

JAMES AVERY,

1351½ Queen St., West. Toronto, Ont.
9

WANTED

Some concern or individual to represent the Pullman Couch Company's Pullman One-Man Transfer Car in Canada.

This transfer car enables one man to transfer lumber to and from all points in the plant. Electrically driven. Guaranteed to pay for itself in 5 months if work is given. Completely covered by patents. The greatest time, money and labor saving device of its kind ever put upon the market or installed in a woodworking plant. Numerous successful installations throughout the country. List furnished upon request.

A real money making proposition to the right party. Liberal commission. Write for full particulars. Give business references. Apply Box 141, Canadian Woodworker, Toronto. 9

FOR SALE

19 H.P. Gasoline Engine, 25 H.P. Wheelock Steam Engine, Steam Chair Back Bender, 2 Spindle Borer Machine, 2 Veneer Presses, 1 Glue Spreader, Double Belt Sander, Cabinet Benches, Surface Planer, Glue Pots, 5 Ton Wagon Scale, 2 Wood Presses, 150 H.P. Boiler, 1 Sheldon Dry Kiln, Factory Trucks.

Manufacturer of Doors and Window Frames, and Dealer in Lumber, Coal, etc.

R. W. NICHOLSON,
8-T.f. Strathroy, Ont.

GOOD VALUES

Subject to Prior Sale

Band Resaw, Connell & Dengler, 54 and 60 inch.
Band Rip Saw, Yates No. 281.
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 30" and 44".
Dowel Machine, Clement.
Dowel Gluer and Driver, E. B. Hayes.
Jointer, Falls Machine Co. under cut 24".
Jointers, 12", 16", 24".
Jointer, Diehl, Continuous Feed.
Lathe, Back Knife, Clement 40".
Matcher, American No. 229 hardwood.
Matcher, Berlin No. 94, 15" x 6".
Moulder, Woods 10 and 12" inside.
Moulder, American 7" and 10" 4 side.
Planers, all sizes, single and double.
Sander, endless bed, 48" H. B. Smith.
Sander, Moore Machine Co. belt.
Sanders, Berlin 26", 42", 48" and 60".
Sander, Clement Belt roller table.
Saws, Berlin Double Cross Cut.

Woodworking Machinery Co., of Buffalo,
54 Mechanic St.,
Buffalo, N. Y.
9 T.f.

POSITION VACANT

Wanted in a progressive Canadian town within 100 miles of Toronto, Ontario, a competent experienced detailer and biller for large millwork factory. Young man preferred with proper qualifications. Answer by letter in own handwriting. State whether single or married and salary expected with all necessary references as to character and ability. Position permanent and working conditions exceptionally good. Address Box 140 Canadian Woodworker, Toronto.
8-9

For Sale

A going concern woodworking plant and retail lumber yard in Manitoba manufacturing sash, doors, store and bank fittings, could add furniture lines, big opportunity. Party retiring through ill health. Would consider revenue bearing property. Apply Box 143, Canadian Woodworker, Toronto. 9

ARTICLES WANTED

Floor Sander Wanted. State price, make and condition of same. Box No. 142, Canadian Woodworker, Toronto. 9

POSITION WANTED

as rod bill and detail man in a furniture factory by one who has held positions as foreman, superintendent and factory manager. Address Box 144, Canadian Woodworker, Toronto.

Lumber Men to Supply Trade Data to Public

In a letter to the newly-established Trade Associations Division of the Department of Commerce, Wilson Compton, secretary-manager of the National Lumber Manufacturers Association, places its whole statistical organization at the service of the government in such a manner that the public will have all the trade information that the lumber manufacturers compile for themselves as soon as, if not sooner than it is available for individual member manufacturers.

The purpose of the National Lumber Manufacturers Association in thus making available to the government and public without charge a statistical service that has been built up through many years at great cost is two-fold. (1) To give prompt and conclusive evidence that the subscribers of the association in the collection and dissemination of lumber trade information neither have nor desire any commercial advantages; (2) to pioneer the way for a general exchange of trade association industrial statistics, through the Department of Commerce, so that it may be possible to obtain an accurate current record of the industrial activities of America.

Scope of Statistics

Mr. Compton's letter gives the Department of Commerce exact information concerning the matter in which the National Lumber Manufacturers Association collects and distributes lumber trade information, which consists of weekly statistics of the softwood lumber movements, giving the production, shipments and orders and changes in stocks as reported by eight regional associations, a quarterly graphic lumber summary and a monthly graphic summary of general business statistics.

It is the conviction of the National Lumber Manufacturers Association that if the Department of Commerce chooses to act favorably on its offer to complete statistical co-operation with the government, other great industrial associations will follow suit, with the result that it will be possible to present to the business world periodically an accurate current statistical picture of the commercial movement of the country. It is hoped that such information, wisely diffused, will help to avoid the excesses of industrial activity which are one of the great contributing causes to alternating periodical business depressions.

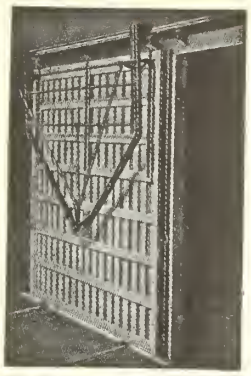
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.
Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

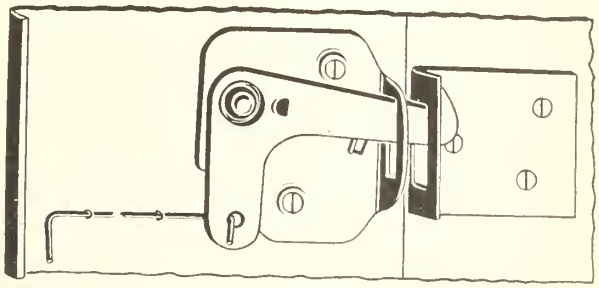
TO GET THE BEST

Use

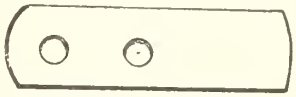
Kasebier
KASEBIER-CHATFIELD SHELLAC CO.
KASEBIER QUALITY GUARANTEED
EST 1881
BLEACHED SHELLAC
KASEBIER QUALITY HAS EARNED ITS REPUTATION. THIS LOT WAS MADE WITH THE DETERMINATION TO KEEP IT
NEW YORK, N.Y.
Quality

Guaranteed

Kasebier-Chatfield Shellac Co.
No. 7 Cedar St., N. Y. C.



No. 22 Table Top Lock



No. 9
Mirror Stop

Furniture Trimmings and Special Hardware

We Also solicit your enquiry for
Special Stampings

Larsen & Shaw, Limited
Walkerton, Ontario

OAKEY'S
Glass Paper, Flint Sand Paper, Garnet Paper
IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

JOHN OAKEY & SONS LTD., WELLINGTON EMERY AND BLACK LEAD MILLS
LONDON, S. E. 1.

Canadian Agents:

F. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

BOX NAILS and WIRE for Every Use

We manufacture a complete line of nails and wire in every style and size. Your special needs can be supplied. Write us today. We manufacture special styles to order.

Laidlaw Bale-Tie Co., Ltd.

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

"The Phillips Line"

Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

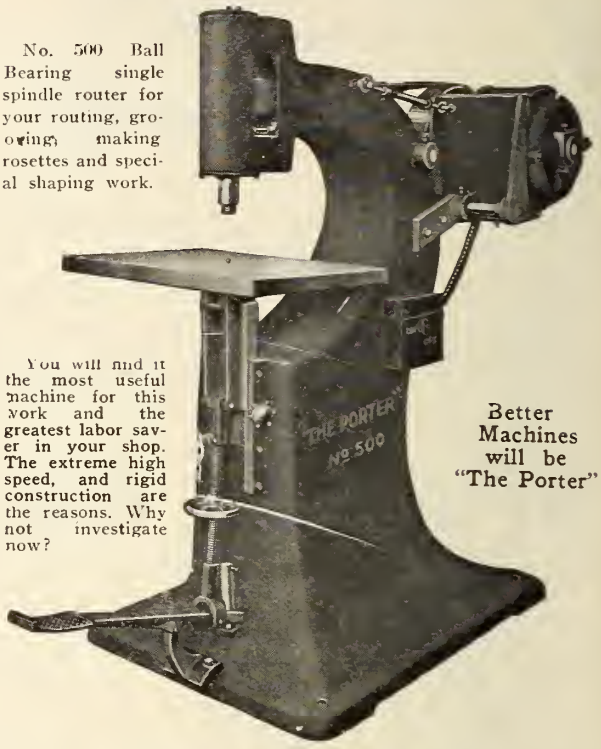
Atlas Mfg. Co. of Orlando

Orlando, Fla., U. S. A.

Subscribe for the
Canadian Woodworker
and
Furniture Manufacturer
Only $2.00 per year

Use the "PORTER"

No. 500 Ball Bearing single spindle router for your routing, grooving, making rosettes and special shaping work.



You will find it the most useful machine for this work and the greatest labor saver in your shop. The extreme high speed, and rigid construction are the reasons. Why not investigate now?

Better Machines will be "The Porter"

C. O. Porter Machinery Co.

666 Front Ave. W. GRAND RAPIDS, MICH.

GRAND RAPIDS FURNITURE MANUFACTURERS

with a combined commercial rating of over

$18,000,000.00

and using approximately

90%

of the total output of kiln dried lumber used in Grand Rapids

Dry Their Stock in

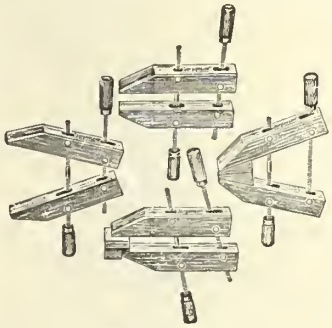
—150—

GRAND RAPIDS VAPOR KILNS

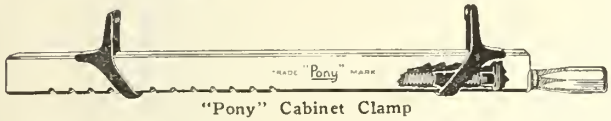
GRAND RAPIDS, MICHIGAN

The "JORGENSEN"
Steel Spindle Hand Clamp

10 sizes Adjustable 10 sizes Rigid Jaws



The truth is the "JORGENSEN" is not constructed down to a price but up to a standard—If you need hand screws, why not get the best, and save money, look for the name "JORGENSEN."



"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.

Manufactured only by the

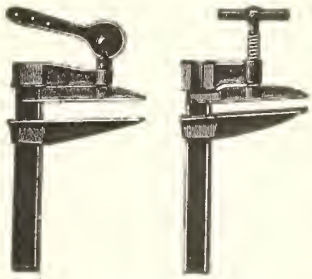
Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

For Sale By

Aikenhead Hardware Limited .....Toronto
Lewis Bros., Limited .....Montreal

Colt's Clamps
for the
Woodworker



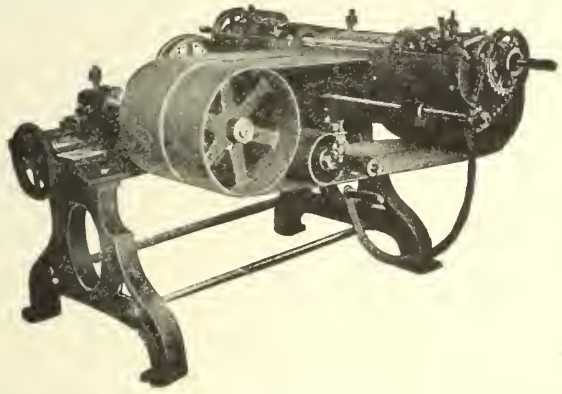
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



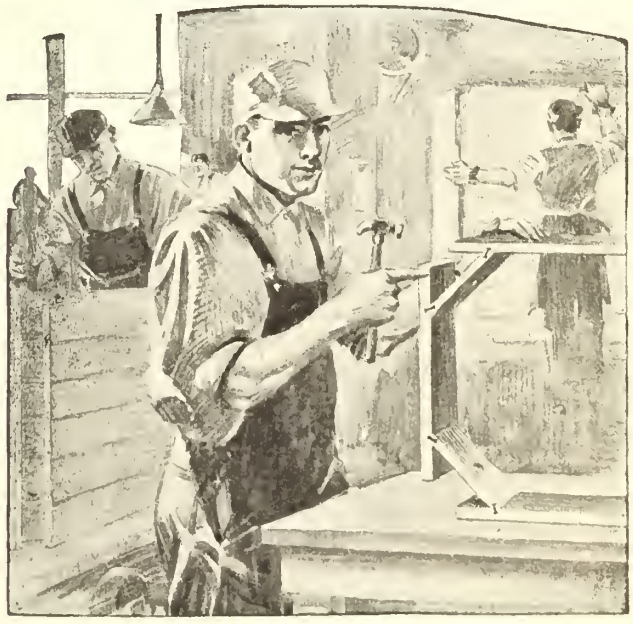
Give your Broom Handles a nice Smooth Finish and get Highest Prices for them. The "OBER" Automatic Sander will do the work Rapidly and Economically. We build Laths, Sanders, Rip-Saws, Bolters, chucks, Chucking Machines, etc. for making Handles of various kinds, Ball Bats, Whiffletrees, Neck Yokes, Spokes, Golf Shafts, etc.

Write for free catalogue No. 31.

The Ober Mfg. Co.

Chagrin Falls, O., U.S.A.

CLAMP NAILS DO IT



The Cabinet Maker

Internationally known and universally adopted by the leading cabinet makers as the most practical and economical method of mitred joinery.

Samples and circulars on request.

CLAMP NAIL COMPANY

4532 Palmer St. CHICAGO, U.S.A.

The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co. Toledo, Ohio.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARING
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Co., Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B. Hamilton Ont.

BAND SAWS
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W. Toronto.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Yates Machine Co., P. B. Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P. B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner, Mass.
Williams Machinery Co., A. R. Toronto, Ont.

BEVEL & MITRE SAWS
Pettingell Machine Co. Amesbury, Mass.

BIRCH
Edward Clark & Sons, Toronto, Ont.

BLOWERS
Canadian Blower & Forge Co. Kitchener, Ont.
Sturtevant B. F. & Co., Galt, Ont.

BLOW PIPING
Canadian Blower & Forge Co. Kitchener, Ont.

BOILERS
Engineering & Machine Works, St. Catharines, Ont.

BORING MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Sons Co., L. G., Gardner, Mass.
Nash, J. M. Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. R. Hamilton, Ont.
Valley City Machine Works, Grand Rapids, Mich.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CARVINGS
Klise Mfg. Co., Grand Rapids, Mich.
Decorators Supply Co., Chicago.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

CARVED WOOD MOULDINGS
Klise Mfg. Co., Grand Rapids, Mich.

CASTERS
Foster, Merriam Co., Merriden, Conn.
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Sons Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C. Indianapolis, Ind.
Shurly-Dietrich, Galt, Ont.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Sons Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company,
Taylor Mfg. Co., Jas. L. Poughkeepsie, N.Y.

CLAMP CARRIERS
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

CRATING LUMBER
Colborn, C. B. Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D. Guelph, Ont.

CUT OFF SAWS
Atkins & Co., E. C. Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Co., of Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rochford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Shimer Cutter Head Co., Galt, Ont..
Yates Machine Co., P. B., Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOORS
Pannill Door Co. Ltd., Toronto, Ont.

DOORS (Flush Veneered)
Hay & Co. Ltd., Woodstock, Ont.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.
Richard-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R. Toronto, Ont.

DOWEL MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company,
Ober Mfg. Co., Chagrin Falls, Ohio.
Preston Woodworking Machinery Co., Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
W. S. Hawker Mfg. Co., Dayton, Ohio.

DOWELS
Canada Wood Specialty Co. Ltd., Orillia, Ont.
Rowe Mfg. Co., Newago, Mich.

DRIERS (Hot Plate)
Merritt Eng. & Sales Co., Lockport, N. Y.

DRIERS (Veneer)
Merrit Eng. & Sales Co., Lockport, N. Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont.
Cutler Desk Co., Buffalo, N. Y.
Grand Rapids Veneer Works, Grand Rapids, Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

DYNAMOS
Industrial Engineering Co., Toronto, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

EDGER SAWS
Atkins & Co., E. C. Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

ENAMELS
Cosmos Chemical Co., Port Hope, Ont.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Garlock Machinery Ltd., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co., Kitchener, Ont.
Sturtevant, B. F. & Co., Galt, Ont.

FEED ROLLS
Atkins & Co., E. C. Hamilton, Ont.

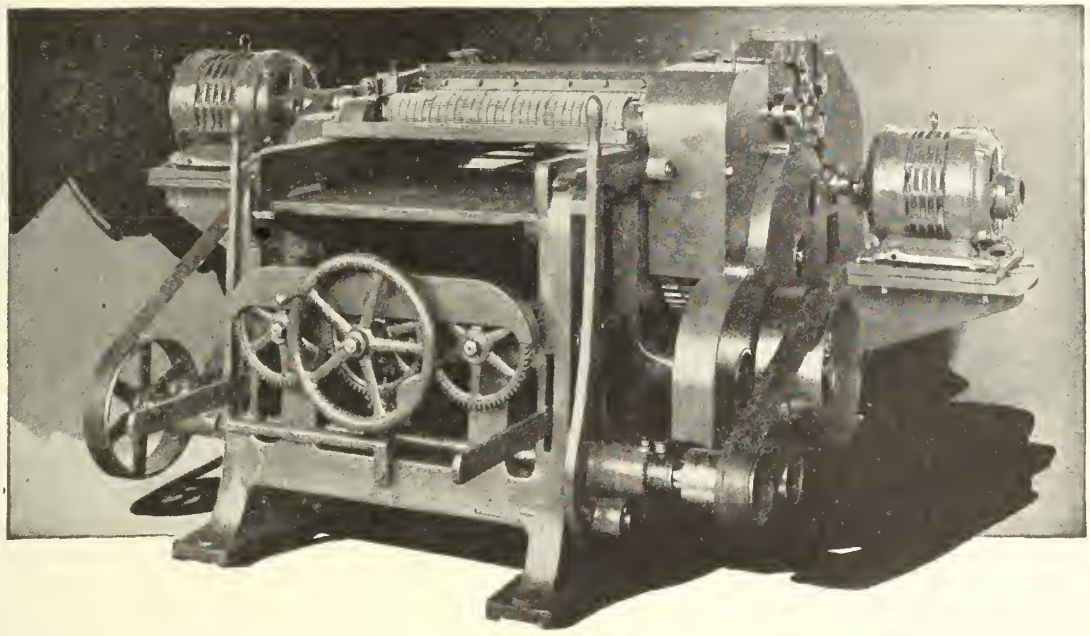
FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FIBRE PRODUCTS
Carter, E. T. Toronto, Ont.
National Patent Reed Sales Co., Philadelphia, Pa.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

FRUIT PACKAGE MACHINERY
St. Joseph Iron Works, St. Joseph, Mich.

SKF



Deep-Groove Ball Bearings
Maintain Cutter-Spindle Settings

ACCURATE planing at high speed is largely a matter of maintaining the correct setting of cutter spindles. If bearings wear, poor workmanship results; if they bind and heat, production is retarded.

But supported on deep-groove ball bearings—properly installed and mounted—vibration is eliminated, the cutter spindles maintain their original setting indefinitely and the bearings show no appreciable wear through years of service. For ball bearings do not absorb power in destructive friction which necessitates frequent and expensive renewal of the linings of plain bearings.

To say that a good planer can be made better by equipping it with deep-groove ball bearings, as made by the Canadian SKF Company Limited, is to state a fact established by experience.

CANADIAN SKF COMPANY, LIMITED

754 TORONTO - - MONTREAL

Races displaced to show DEEP-GROOVE bearing carrying maximum end thrust in a forward direction.

Races displaced to show THE SAME bearing carrying maximum thrust in reverse direction.

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N. Y.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.
Dominion Appraisal Co., Toronto, Ont.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.

GLUE
Canada Glue Co., Brantford, Ont.
Cannon Canadian Co., Toronto, Ont.
Coignet Chemical Products Co., New York, N.Y.
Kane Manufacturing Co., Chicago, Ill.
Monite Waterproof Glue Co., Minneapolis, Minn.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Taylor Mfg. Co., Jas. L. Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.

GLUE ROOM EQUIPMENT
Merritt Eng. & Sales Co., Lockport, N.Y.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R. Toronto, Ont.

Grinders (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng. & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.

GROOVERS
Atkins & Co., E. C. Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Mattison Machine Works, Rochford, Ill.

GUM LUMBER
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W. Va.
Rush Lumber Co., Memphis, Tenn.
Turner-Farber-Love Lumber Co., Leland, Miss.

HAIR (Curled)
Blocksom & Co., Michigan City, Ind.

HAND SCREWS
Fay & Egan Co., J. A. Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rochford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.

HARDWOOD DIMENSION STOCK
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER ... ...
Anderson-Tully Co., Memphis, Tenn.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr-Holaday Lumber Co., Greenfield, Ohio.
Bruce Co., E. L. Little Rock, Ark.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Clark, Edward & Sons, Toronto, Ont.
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Dudley Lumber Co. Inc., Memphis, Tenn.
Farrin Lumber Co., M. B., Cincinnati, Ohio
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La.
Hafner Manufacturing Co., St. Louis, Mo.
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co., Toronto, Ont.
Kinnon Lumber Co. Ltd., Toronto, Ont.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville, Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Merceau-Hawkins Tie Co., Huntington, W. Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Otis Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Walnut Co., St. Louis, Mo.
Richards Hardwood Co., Memphis, Tenn.
Rush Lumber Co., Memphis, Tenn.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Sullivan, Frank T. Buffalo, N. Y.
Turner-Faber-Love Lumber Co., Leland, Miss.
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng. & Sales Co., Lockport, N.Y.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

Knobs
Waddell Mfg. Co., Grand Rapids, Mich.

LACQUERS
Cosmos Chemical Co., Port Hope, Ont.
Celluloid Zapon Co., New York, N. Y.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rochford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.

LEGS
Klise Manufacturing Co., Grand Rapids, Mich.

MACHINE KNIVES
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

MITRE SAWS
Atkins & Co., E. C. Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.

MOTORS
Industrial Engineering Co., Toronto, Ont.

MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

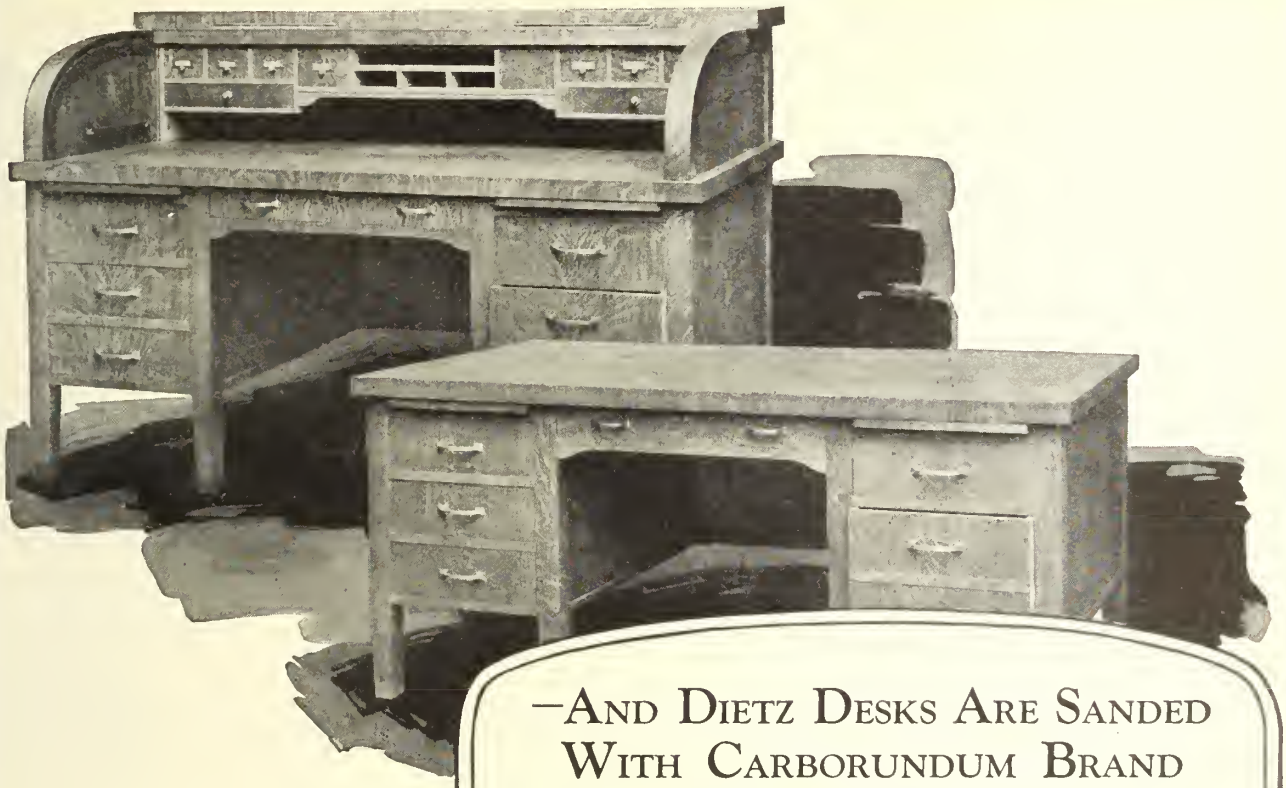
NAILING MACHINES
Morgan Machine Co., Rochester, N. Y.
Yates Machine Co., P. B., Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PAINT
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Calhoun Plywood Co., Sheboyan, Wis.
Hardwood Products Co., Neenah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Mattison Machine Works, Rochford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont



—And Dietz Desks Are Sanded With Carborundum Brand Garnet Products

An office desk can be made "a thing of beauty and a joy forever" as well as a highly necessary adjunct to commercial life.

The J. F. Dietz Desk Company of Cincinnati, for forty-one years makers of fine desks, has proved this long ago. This concern makes office desks that are, in a sense, inspirational in their graceful lines, in the beauty of their woods and above all in the splendor of their finish.

There is a feeling of pride in our knowing that Carborundum Brand Garnet Paper and Cloth do a big share in the producing of these desks of quality.

Carborundum Brand Garnet Paper and Cloth are used on their disc and drum sanders. And the hand-finishing too is done with the Carborundum Brand Garnet Paper.

Quality and finish are characteristic features of any Dietz Desk. For the latter they look to Carborundum Brand Garnet Products—and they do not look in vain.

In such big plants and in little plants too
you will find that

CARBORUNDUM BRAND GARNET PRODUCTS MAKE GOOD SANDERS BETTER SANDERS

The Carborundum Company

Niagara Falls, N. Y., U. S. A.

New York, Boston, Chicago, Cleveland, Detroit, Cincinnati, Philadelphia, Pittsburgh, Milwaukee, Grand Rapids

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Bury, Robt. & Co. (Can.) Ltd., Toronto, Ont.
Calhoun Plywood Co., Sheboygan, Wis.
Guelph Patent Cask Co., Scotstown, P. Q.
Hay & Co. Ltd., Woodstock, Ont.
Wisconsin Veneer Co., Rhinelander, Wis.

PERIOD MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter, E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FOLLOE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
McKenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co., Herman, Brooklyn, N. Y.

SASH, DOOR & BLIND MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SATINWOOD
Willey Co., C. L., Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P. Q.

SAW FILING MACHINERY
American Saw Filing Machine Co., Boston, Mass.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKenzie Machinery Co., D., Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW TENONERS
Pettingell Machine Co., Amesbury, Mass.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHELLAC
Kasebier-Chatfield Shellac Co.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Bruce Woodworkers Ltd., Chesley, Ont.
Walter & Company, B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis.

TEMPERATURE REGULATORS
Canadian Powers Regulators Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N. Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.
Hay & Co. Ltd., Woodstock, Ont.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Klise Manufacturing Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

TWIST WORK
Klise Manufacturing Co., Grand Rapids, Mich.

UPHOLSTERY
Oriental Textiles Co., Oshawa, Ont.

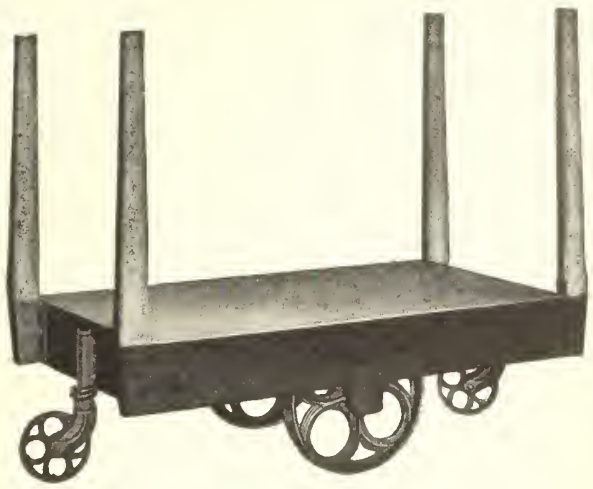
NEW AND USED
Woodworking Machinery

C.M.C. double carriage cut-off saw.
60″ Fay & Egan re-saw.
60″ Egan band re-saw.
54″ McDonough horizontal band re-saw.
42″ West Side band re-saw.
12″ C.M.C. four-side moulder.
American variety woodworker.
No. 551 C.M.C. chain saw mortiser.
18″ Defiance handle lathe.
30″ Boss double surface planer and matcher.
24″ Clark-Demill planer and matcher.
24″ Yates, single surface planer.
24″ Cowan pony planer.
20″ Preston pony planer.
48″ Berlin, three-drum sander.
42″ Invincible three-drum sander.
20″ American wood scraper.
Preston double head tenoner.
Gerlach stave machine.
Long lath bolter.

Write for full particulars and our complete stock list

H. W. Petrie, Limited
131—147 Front Street West
Toronto

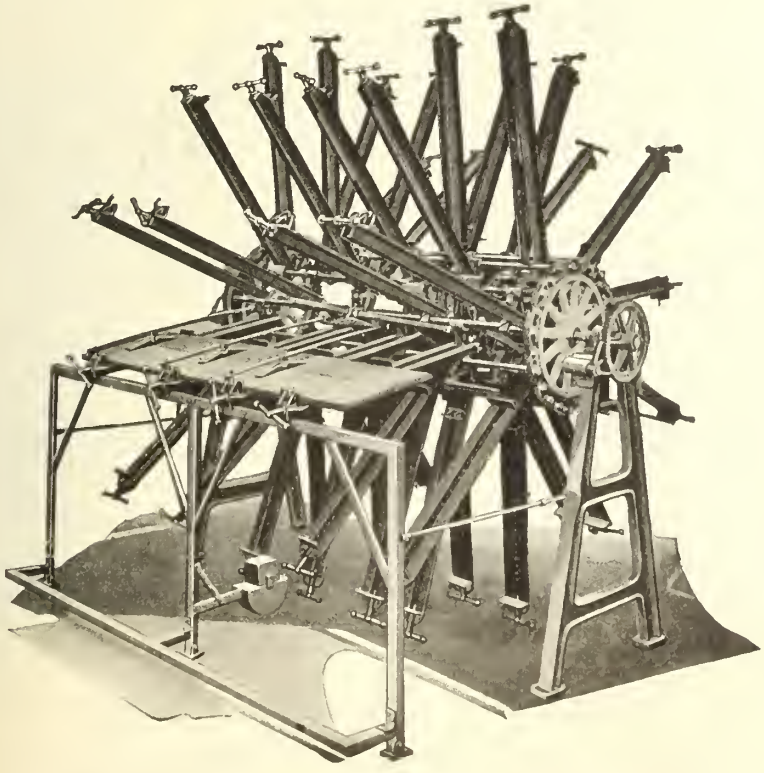
NOW IS THE TIME



To Cut Your Production Cost by Using
"GLOBE"
ALL STEEL FACTORY TRUCKS
Made in 3 sizes :
24″ x 52″ 28″ x 58″ 34″ x 70″

Globe Vise & Truck Co.
GRAND RAPIDS, MICH.

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK

CLAMP CARRIER
for
Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISH DRYERS
Nicholls Co., A. S., New York, N. Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Company, Robert, Toronto, Ont.
Guelph Patent Cask Co., Scotstown, P. Q.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mohawk Veneer Co., Warren, Pa.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland, Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N. Y., High Point, N. C.
Wisconsin Veneer Co., Rhinelander, Wis.
Willey Co., C. L., Chicago, Ill
Wood Mosaic Co., Louisville, Ky.

VENEER CLIPPERS
St. Joseph Iron Works, St. Joseph, Mich.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N. Y.
St. Joseph Iron Works, St. Joseph, Mich.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Des Moines Sawmill Co., Des Moines, Iowa.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.
Sullivan, Frank T., Buffalo, N. Y.

WASTE
Carter, E. T., Toronto, Ont.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

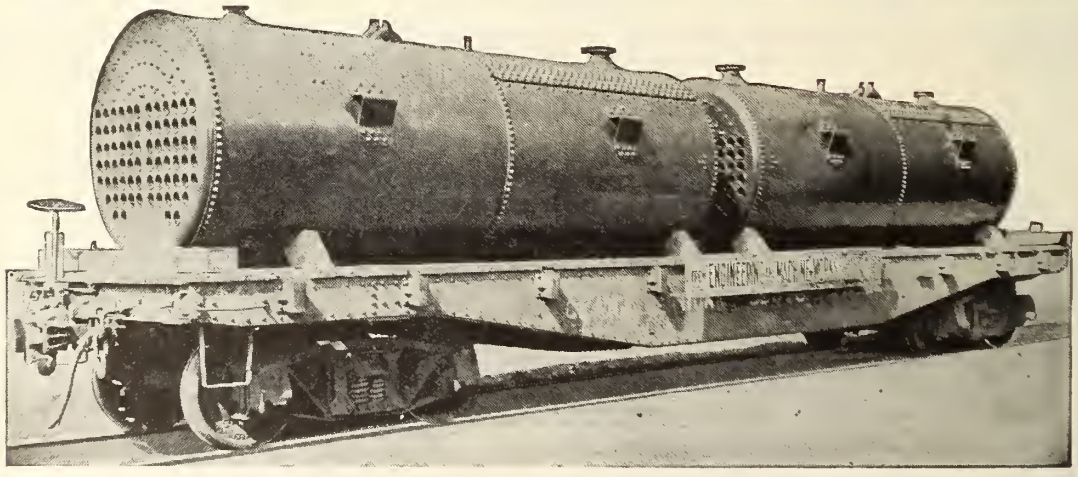
WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WOODWORKING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Elliot Machinery Co., Belleville, Ont.
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Pettingell Machine Co., Amesbury, Mass.

WOOD TURNING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Elliot Machinery Co., Belleville, Ont.
Garlock Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

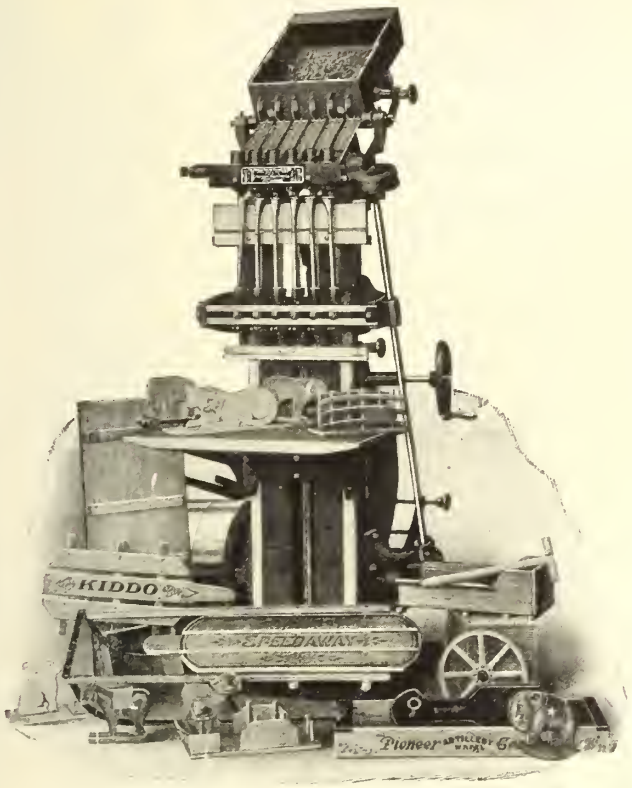


Here is a money-making suggestion for you

Let us sell you a new Boiler—or at least, equip your present ones—with our National Hand Operated Stocker—which gives wonderful economy and efficiency with low grade or waste fuels, and, being operated with a simple system of push rods, can be used by any available labour. Send for Booklet today.

Engineering and Machine Works of Canada, Limited
St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal



Morgan No. 6 Nailing Machine

MORGAN
NAILING MACHINES
Used in Nailing Wooden Toys

Many manufacturers of American Wooden Toys use our machines for driving 5/8" to 1 1/8" nails. Machines are adjustable in operation and can be adapted to any kind of nailing work.

If you are driving nails by hand, in making boxes, crates, toys, any woodenware articles, figure the cost. It is expensive.

Then send us samples of your work. Get an estimate of the cost of nailing on a Morgan Nailing Machine. Compare the figures. We'll leave the rest to your judgment.

Send us your nailing problems. We shall be pleased to give them our careful consideration and advise you regarding equipment for handling them. We invite your inquiry.

Morgan Machine Company
Rochester, N. Y.

THIS IS THE NAME

of the Machinery for the Rapid Production of

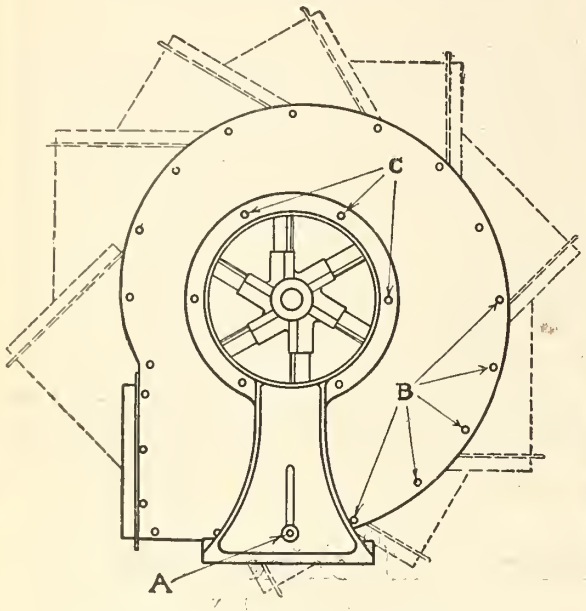
Veneer—Crates—
Baskets—Fruit Packages.

"ST JOE"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

Canadian Mill Exhausters



One of the features of the Canadian Planing Mill Exhauster is the reversible housing. It is easily adjustable to either hand and to any discharge.

By this arrangement one fan may be used to meet all requirements, thus eliminating crossed belts and sharp angles.

Let our engineering department help you plan your refuse exhauster system.

Write for catalogue 400-13.

Canadian Blower & Forge Co.
KITCHENER, ONT.

MOTORS

RELIABILITY-KNOWLEDGE-PRICE

Motors—60 Cycle

1—3 H.P. Packard, 3 phase, 220 or 550 volts.
6—1/6 H.P., single phase new.
1—5 H.P. Can. Gen. Electric.
1—7½ H.P. Lincoln, and one 7½ H.P. Fairbanks.
1—10 H.P. Gen. Elec. and Lincoln.
1—20 H.P. General Electric.
1—30 H.P. newly rewound by Swedish General Electric.
4—25 H.P. General Electric.
1—50 H.P. General Electric.
1—75 H.P. General Electric.
1—100 H.P. Westinghouse and General Electric.
Above 5 H.P. motors equipped with regular starters.

Motors—25 Cycle

1—5 H.P. Crocker-Wheeler, 1500 r.p.m., 220 volts.
1—2 H.P. Langdon Davies, 1500 r.p.m., 500 volts.
1—40 H.P. Westinghouse, 720 r.p.m.
1—15 H.P. British Gen. Elec.

Other various sizes and new Westinghouse stock all sizes.

Direct Current Motors and Generators
125-250 Volts

1 K.W.
2 K.W.
3 K.W.
5 K.W.
10 K.W.
Westinghouse, Can. General Elec., Lincoln.

Complete with rheostats and pulleys.

60 Cycle, 3 Phase Generators

60 Cycle, 3 Phase Generators
30 K.W.
50 K.W. 1200 r.p.m. General Elec. and Westinghouse.
75 K.W. Westinghouse.
100 K.W. General Elec., 2300 volts, 900 r.p.m.
300 K.W. Westinghouse, 200 r.p.m.
600 K.W. Electrical Machinery 225 r.p.m.
All. complete with exciters and rheostats.

2—175 H.P., 3 cylinder gas, gasoline or crude oil Westinghouse Vertical Engines —250 r.p.m.

Industrial Engineering Company of Canada Ltd.

CONSULTING ENGINEERS - ELECTRICAL EQUIPMENT

R. G. LEE, General Manager

Carlaw Building, Toronto - Royal Bank Building Windsor, Ont.

"OLIVER"

Self Contained JIG SAW

Features—

1. Self Contained
2. Simple Design
3. Few Parts
4. No Springs
5. No moving parts above saw blade
6. Increased Efficiency
7. Reduced Vibration
8. Tilting Table
9. Quick in operation
10. Smoother Work

Think of it—no vibrating or moving parts above the saw blade—not even a spring—Sounds unreasonable—impossible. The proof is in the unexcelled operation. It does superior work with less power and in less time.

Send for circular of this or of any "Oliver" Woodworking Machinery.

Oliver Machinery Co.
Grand Rapids, Mich., U.S.A.

Cross Sectional View of Planer Knife. Shaded portion indicates the High Speed Steel Edge "welded" to the face of the knife.

Users of Ordinary Thick Knives Can Now, by the Simonds New Method of "Welding" Obtain the Same Cutting Efficiency that Users of Thin High Speed Steel Knives Secure

It has been an accepted theory that high speed steel knives could not be welded. Yet here it is by the new Simonds process welded to a soft metal backing. This allows us to heat treat the knives to bring out the utmost in cutting efficiency. Old style high speed steel knives cannot be heat treated because the braze will come apart like any other soldered article. Welded knives do not come apart. They give longer service and last longer. We can now furnish these "welded" high speed steel knives for Spoke, Moulding, Lathe, Chair, Jointer and Planer Knives up to 30 inches long. We know of no other knife manufacturer that can supply these welded knives. The price is the same as for the ordinary brazed high speed steel knife. Book your orders now.

Simonds Canada Saw Co., Ltd.

Montreal, Que.

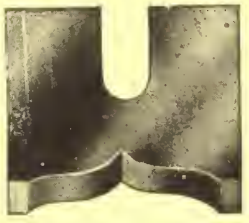
St. John, N. B. - **Vancouver, B. C.**

ATKINS

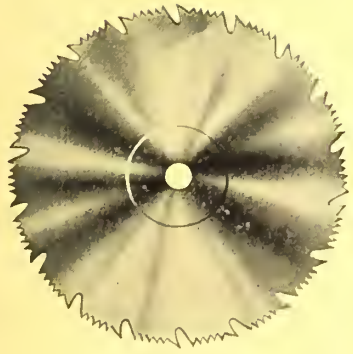
STERLING QUALITY

SAWS and KNIVES

ECONOMIZE



ARE your saws and knives wasting your lumber? If so, why not turn that waste into a profit by installing

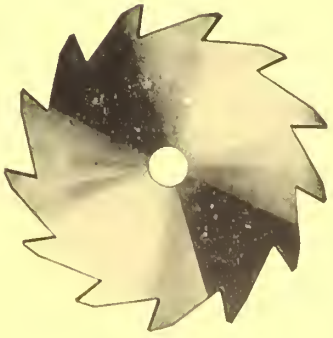


Atkins Sterling Quality Saws

and Machine Knives

Some of the largest woodworking mills in the country are using Atkins Saws exclusively, because they increase production, stop waste and make a name for themselves wherever they go.

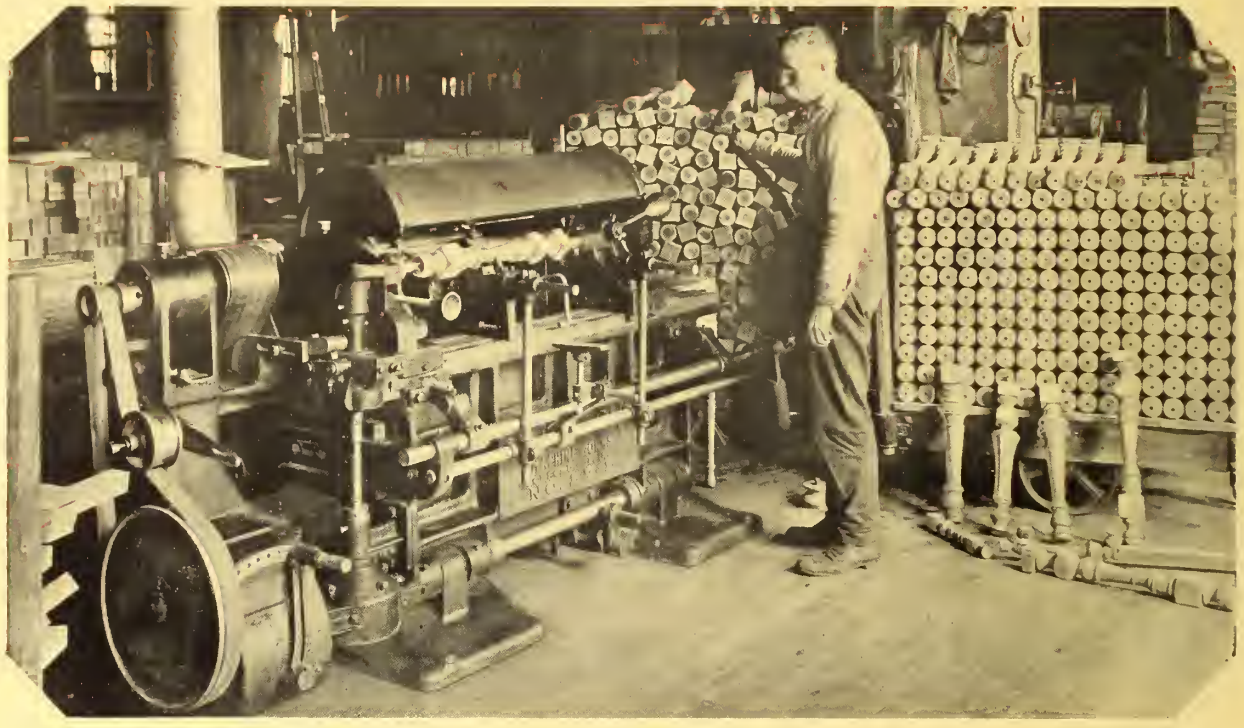
Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.



E.C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**



New Model "D" Mattison Automatic Shaping Lathe at Rockford Desk Co.

Today, the up-to-date plant is replacing its old-style automatic lathes with the new, more efficient model for the same reasons they are replacing old-fashioned planers and saws with modern equipment.

SOME people, even though they have a turning machine, still think of the modern automatic lathe as a more or less special machine, adapted for the large plant making turnings by the thousands.

The fact is that for the average manufacturer of furniture ornamented with turnings, the Mattison Lathe is just as standard as a planer. Often more money is spent for turnings that go into production than for planing the lumber that goes into production.

Who would think of continuing the use of an old-fashioned planer when a new, more modern one would do the work at half the cost and much more accurately? For the same reason, he should also consider the New Model D Lathe.

Changing conditions in furniture manufacture have resulted in our redesigning the lathe and building it new from the ground up. It is easier and faster to operate, does better work, saves more material.

Even though you now have an old type lathe in operation, it will be worth your while to investigate the production possibilities of this New Model.

There is only one Mattison Lathe and only Mattison builds it

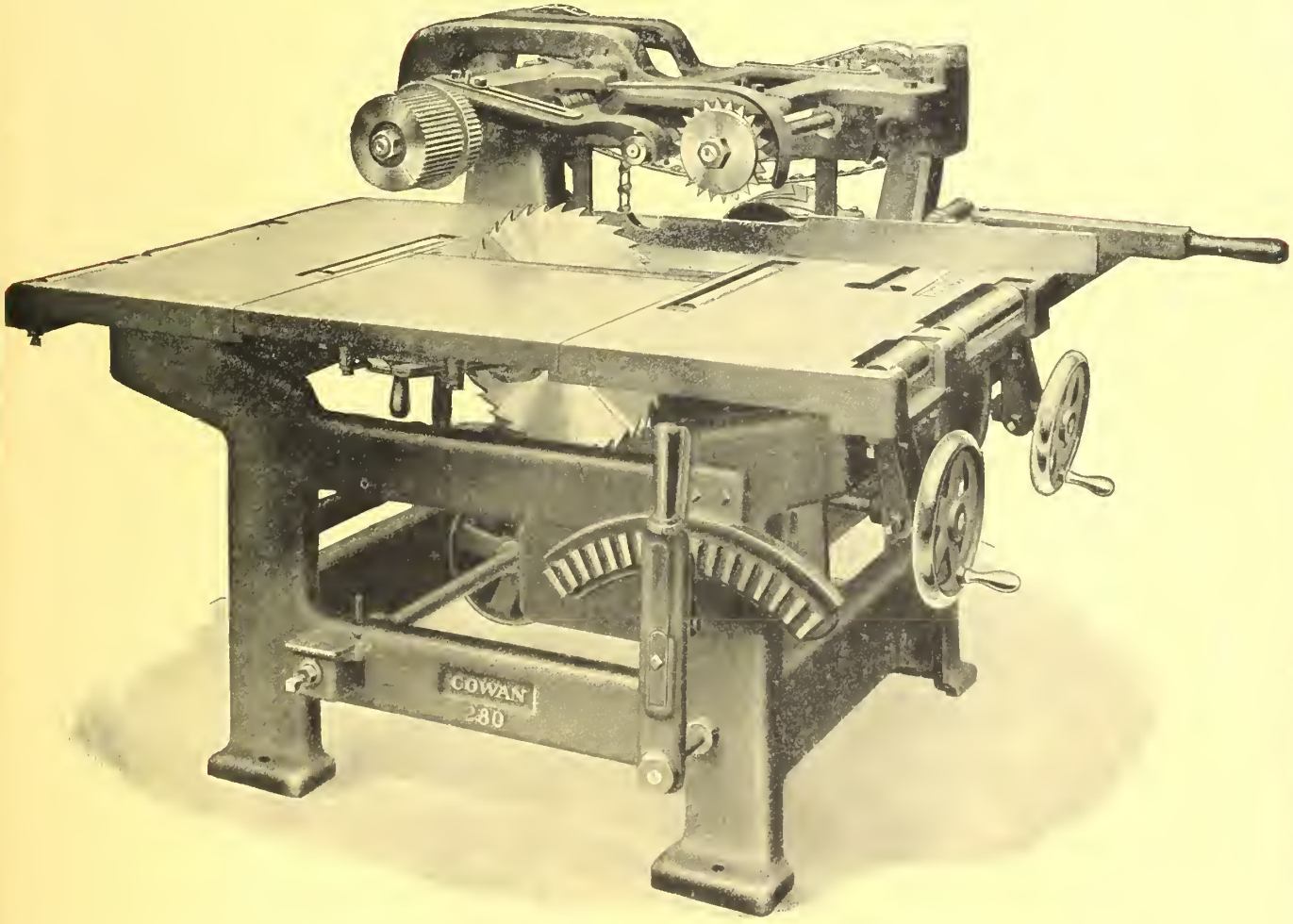
MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.

Volume Twenty-Two TORONTO, October, 1922 Number Ten

CANADIAN WOODWORKER and Furniture Manufacturer

Power Feed Rip Saw 280

Variable Feed, Large Table, Simple, Strong, Compact



Woodworking Machinery That Satisfies

COWAN & COMPANY OF GALT LIMITED

Galt, Ontario, Canada

Alphabetical Index to Advertisers, Page 12

FAY & EGAN RESAWS

Excel All Others

The No. 280 "Lightning" is extremely worthy of its name.

Request Bulletins of this and our other resaws

J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St. - - Cincinnati, Ohio, U. S. A.

Exclusive Agents for the Dominion: A. R. Williams Machinery Company, Ltd., Toronto, Ont.
Branches: Montreal, St. John, N. B., Winnipeg, Vancouver

We are Canadian Representatives for

The American Woodworking Machinery Company of Rochester, New York

This Company are the Largest Manufacturers in the world of Woodworking Machinery. We have full information and Circulars of every machine they produce and will be glad to give you prompt service as to prices etc., on any machine you are interested in. This is the time to install new machines to bring your plant up to date. Below is a list of machines made by the American Wood Working Machinery Company.

Re-Saws—Band Re-Saws 30 to 42″ capacity—Combination Scroll and Re-Saws—Chain feed Edging Saws—Double Cut-off Saws with friction drive to moveable Head Stock—Swing Saws with removeable Arbor—Combination Saw and Dado machines—Fast feed Planers and Matchers from 100 to 300 feet per minute capacity—Hardwood Flooring machines—Double Surfacers for Cabinet, Furniture, Sash and Door and Planing Mill Equipment. Single Surfacers—Buzz Planers with and without power feed attachment—Fast feed Inside Moulders—Outside Moulders from 4 to 12″ capacity—Complete line of Sash and Door Equipment including panel raisers—Sash Dovetailers—Sash and Door Clamps—Sash Jointer and Sander—Sash Relishers—Hollow Chisel Mortisers—Shapers, single and double spindle with Babbit, Bronze and Ball Bearings—Single End Tenoners for light and heavy work—Horizontal and Vertical Boring Machines, with single and multiple spindles—Patternmakers and Wood Turning Machines—Drum Sanders—Roll feed and revolving bed—Sanders Disc,—Spindle, Drum and Belt. Grinders for thin knives, thick knives and Emery. Veneer Presses.

We are able to offer complete line of machinery for Planing Mills—Sash and Door Plants—Cabinet Plants—Furniture Factories—Box Shops and General Woodworking Industries.

GARLOCK MACHINERY LIMITED

WOOD WORKING AND METAL WORKING MACHINERY

163 DUFFERIN ST. TORONTO TELEPHONE, PARKDALE 7855

Specialists in Wood Working Machinery

All you ever knew about a Lumber Kiln is out of date. You can't select today the best kiln from past experience. Your best friend's advice wouldn't be any better.

You owe it to yourself to investigate the results obtained from Cutler Kilns. For the last two years our customers have been drying lumber in half the time required by the best of other kilns — and getting better lumber.

We can furnish records of actual Kiln runs — or show you kilns in operation.

Either one will convince you of the wonderful improvements over the old methods. — Write Us.

All essential features of Cutler Kilns are fully protected by mechanical and process patents granted and pending.

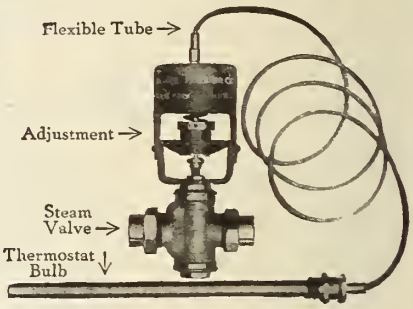
CUTLER DESK COMPANY
Dept. F. Buffalo, N. Y.

Cutler
DRY KILN
Better Drying in haly the time

Controlling Heat For Industry

Powers Regulation, installed on any system of artifical heat, insures economy, safety, and the correct temperature.

Regardless of the kind of temperature to be controlled—whether of liquid or air —or for what purpose—there is a Powers Regulator specially adapted to that purpose—for controlling the temperature of a single room or an entire building—for vats—ovens—dryers—dyers—kilns —glue pots—varnish rooms—and many other places where heat control is necessary for best results.



The Powers Regulator No. 11

Specially adapted for the control of liquid temperatures as in hot water tanks, acid baths, glue pots, dye kettles, etc. Entirely automatic and self-contained, requiring no outside power for operation. Send for Bulletin 129. Other designs for other uses, wherever heat control is desirable.

Powers Regulators save time, conserve energy, protect material in process of manufacture. They are automatic, dependable, accurate.

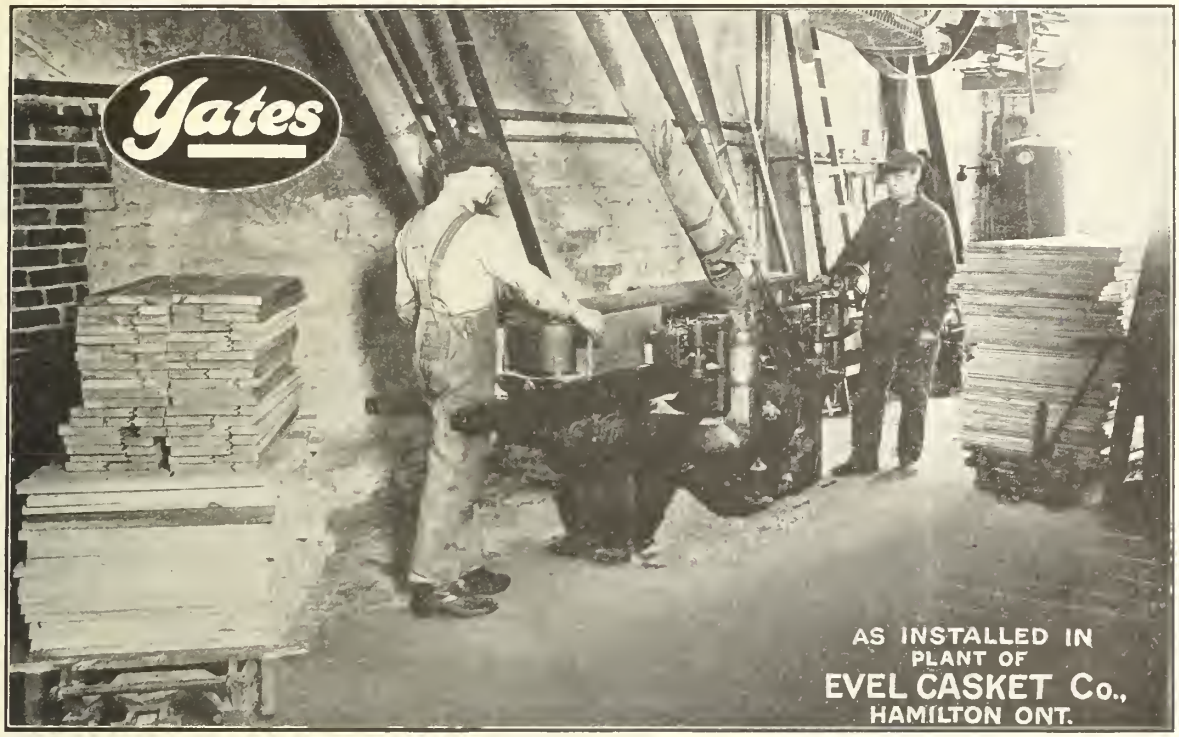
Powers Regulation is the result of more than 30 years of labor in this one field. Let us help you in meeting today's manufacturing problems.

The Canadian POWERS REGULATOR CO. Ltd.
Specialists in Automatic Heat Control

82 Chestnut Street — Toronto, Ont.

Calgary, Alta. - Halifax, N.S. - Montreal, Que.
Vancouver, B.C. - Winnipeg, Man.
Please consult your Telephone Directory for local address

(1818)



——ACCURACY——

That's the main point in a Glue Jointer. It must make at machine speed joints so smooth and straight that they can scarcely be detected in the finished product. Such a machine is

YATES No. 213 Continuous Feed Glue Jointer

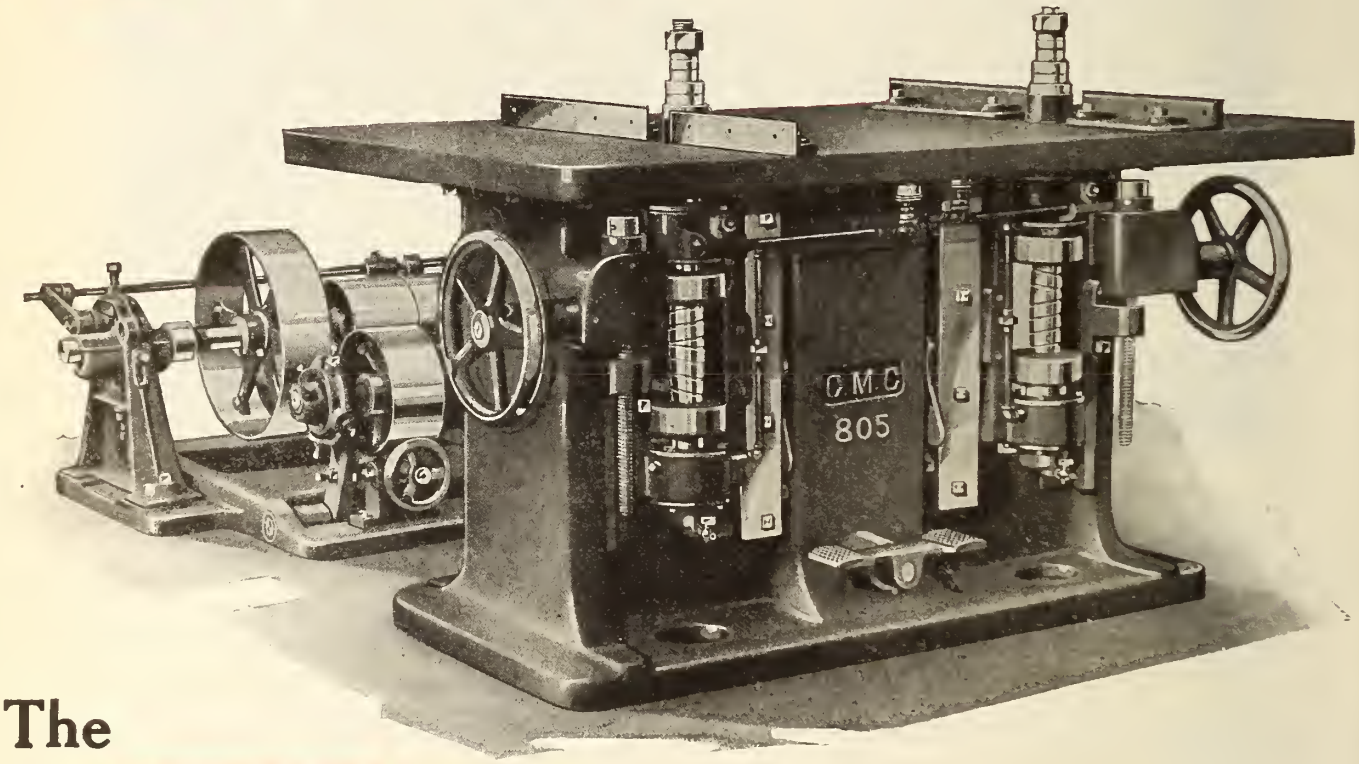
The 213 is adaptable to many other kinds of work as well as Glue Jointing, and has so proven itself. With a 213 short and narrow stock can be accurately jointed and glued together, thus saving these small pieces that otherwise would go to the scrap heap.

Our 30 page Glue Jointer Book is one of the most comprehensive books on Glue Jointing. Gladly Send you one upon request.

P. B. Yates Machine Co. Limited

Hamilton - Canada

Cut Your Costs — on an "805"



The C.M.C. "805" Double Spindle Ball Bearing Shaper

Produces at least fifty per cent. more work of superior quality than ordinary babbitt bearing machines. Takes up the same floor space, consumes less power and gives continuous satisfactory service day in and day out.

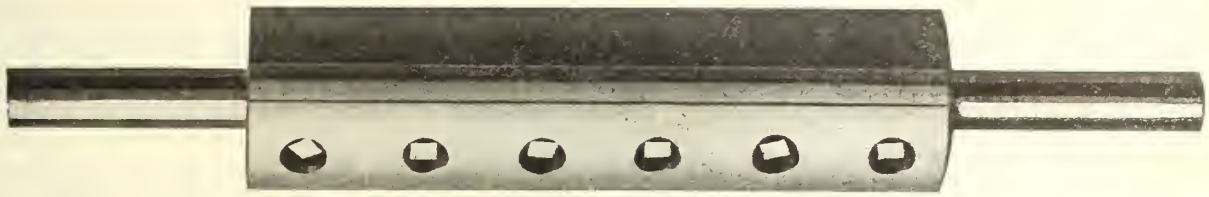
C.M.C. Ball Bearing Shapers are built differently from others. Our exclusive features include special mounting of ball bearings and constant visible lubrication.

Numerous satisfied users will testify as to the merits of these machines. ask them.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721 Bank of Hamilton Bldg.

The Shimer Round Safety Cylinder with High Speed Knives



A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

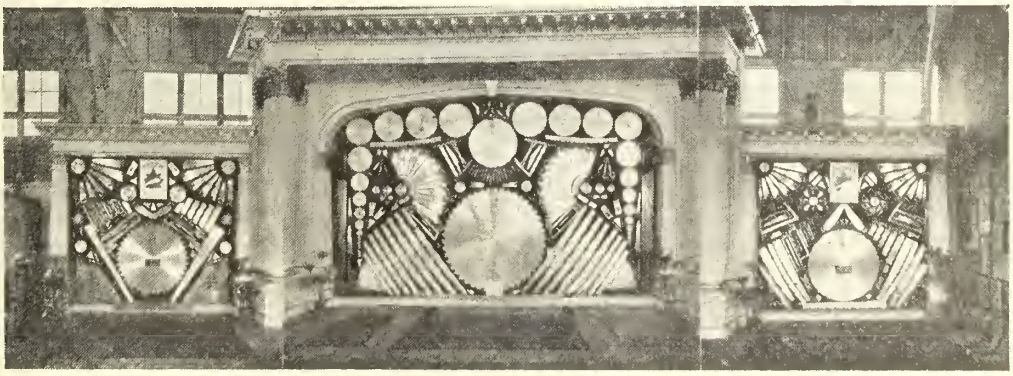
WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

MAPLE LEAF SAWS



A Saw For Every Purpose

Used by all the principal Woodworking & Furniture Mfgs.

Throughout Canada

Cross-Cut Saws
Band Saws
Dado Heads

Special Saws for Special Work

Circular Saws
Hand Saws
Woodworking Cutters and Knives

Manufactured by

SHURLY-DIETRICH, LIMITED, The Largest all-Canadian Saw Manufacturers

GALT, Ontario

"WILLIAMS"
WOODWORKING MACHINERY

In Stock For Immediate Delivery

1 New No. 8 Beach Rip and Cross Cut Saw Table, with 6" Jointer and Boring machine. A real portable Woodworker.
1 New No. 107 Crescent Woodworker,—26" Band Saw, Rip and Cross Cut Saw Table, 26" Bandsaw, Reversible Shaper, 12" Jointer and Boring Machine. All individually controlled. 5 H.P. to 7½ to operate.
1 Used No. 14 Sidney Woodworker, 27" Band Saw, Rip and Cross Cut Saw Table, 12" Jointer, Shaper, and Boring Machine, together with H.C. Mortising attachment, Planing attachment.
1 New Williams Variety Saw Table, with tilting table, raising and lowering mandrel. Cuts 2" above the table.
1 New 6 ft. Beach 6 stop Boxmakers Saw Table.
1 New Beach Tilting Top Saw Table, cuts about 3¼" above table.
1 Used No. 3 Beach Double Cut Off Saw, 6" to 80" between saws.
1 New No. 127 Preston Dimension Saw Table.
1 Used McGregor Gourlay Double Rip and Cut Off Saw, 72" between saws.
1 Used Clark Demill 3-side Planer and Matcher, 13", feed about a 100 feet a minute.
1 Used Cowan 24" Planer and Matcher.
1 Used M. 31 Cowan Dowel Machine, with ⅜", ½" and ¾" heads.
1 New No. 133-A Oliver 4" Bench Jointer, arranged for 25 cycle or 60 cycle operation.
Used 1 qt. capacity Glue Pots, no water or steam required, operate wherever you have a light variable heat.
1 New C.M.C. 12" Buzz Planer with round cylinder.
1 Used No. 44 Berlin 9 x 6 Double Cylinder Planer and Matcher.
1 Used Woods No. 110 Inside Moulder.
1 Used 20" Eclipse single surface Planer.
1 Used 26" Cowan Double Surfacer.
1 Used No. 177 Berlin Double Surface with divided rolls.
1 Used 26 x 10 McGregor Gourlay Double Surfacer, like C.M.C. 216.
1 Used 24" Cowan Double Surface Planer and Matcher.

We also have on our lists (not in stock at Toronto) a Mershon 54" Band Re-Saw, a S.A. Woods No. 401 15 x 6 Planer and Matcher, a No 91 Berlin 15 x 6 Planer and Matcher, a No. 34 Woods, 18 x 6 Planer and Matcher, and also a McGregor Gourlay QY 15 x 6 Planer and Matcher.

We will gladly send particulars of these machines on request

If it's Machinery—Write "Williams"

The A. R. Williams Machinery Co., Ltd.

Dept. C.W., 64 Front St. W., Toronto

Phone Woodworking Department—Adelaide 20

Halifax - St. John - Montreal - Winnipeg - Vancouver

MADE IN SCOTLAND

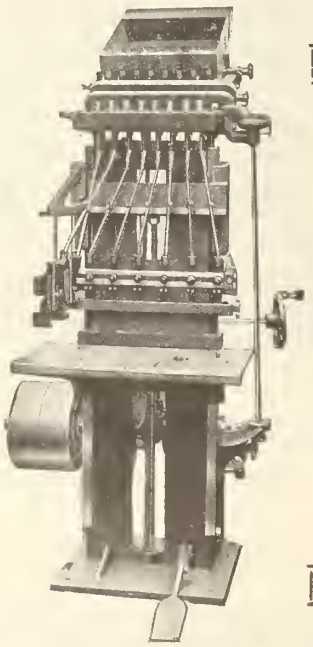
ENTIRELY AUTOMATIC

EASILY OPERATED

MACHINES FOR PLAIN OR ZIGZAG NAILING

BOX NAILING AND CLEATING MACHINES

ALSO MADE FOR CLEATING or BATTENING



INSTANTLY ADJUSTED

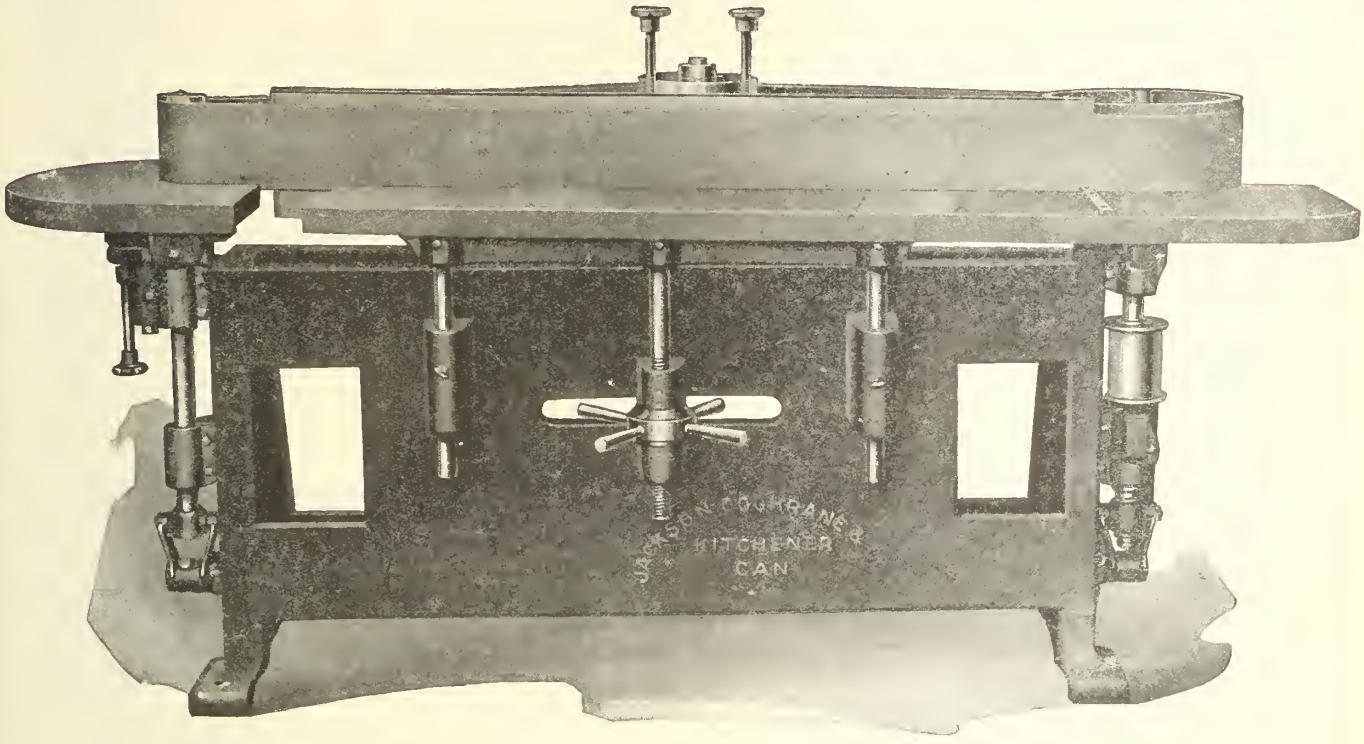
MADE IN ALL SIZES

MAY WE SEND YOU A CATALOGUE?

MATTHEW WYLIE & Co. Ltd.

81 PORTMAN STREET, GLASGOW

No. 272 Oscillating Belt Sander



No. 272. Oscillating Belt Sander for Edged and Shaped Work

This style of belt sander has a capacity several times greater than sanding drums or spindles. The high speed sand belt covers a long surface and retains its sharp and fast cutting properties. The long travel of the belt gives it an opportuntiy to cool off between contacts, whereas on drums and spindles, where the sanding surface is small, the wear is continuous and in one place.

It will also finish practically any piece of straight or bent work that can be supported on the tables or held against the platen or sanding rolls.

The design and construction eliminates all chance of vibration, thus insuring a perfect sanding contact. The tables provide an even and accurate support for the work, and as the belt travels with an oscillating movement, a perfect finish is assured.

The tables are the proper height and permit the operator to handle his work in a natural position. Numerous sizes of sanding rolls, special forms for shaped work and non-revolving sanding spndles may be used for sanding a large variety of work. The long platen between the sanding pulleys may be removed and replaced with special forms for any work having rounded edges.

This sander is so constructed that a number of stationary forms may be used for special work.

Features of Our No. 272 Oscillating Belt Sander

Heavy construction eliminates vibration.

Long belt surface prolongs life of sand belt.

Oscillating movement prevents scratch marks.

Belt pulleys covered with heavy coating of rubber provide a good driving surface and a perfect sanding cushion.

Large tables and each adjusted independently of the other.

S.K.F. ball bearings in small belt pulley.

Improved belt tightening device.

Convenience of operation.

Large capacity.

Very moderate price.

Large descriptive circulars now ready. Send for one and get full particulars on this Sander.

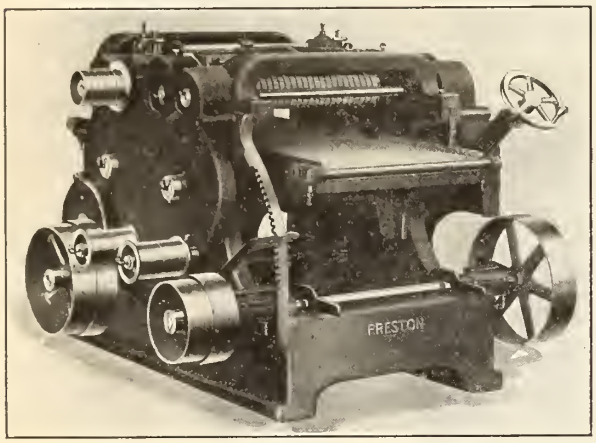
Specifications:

Large Sand Belt Pulley	14″ dia. x 8½″ face
Small Sand Belt Pulley	3½″ dia. x 8½″ face
Circular Table	25″ wide 11″ from spindle to end. 19″ long overall.
Long Table	72″ x 12″
Platen	60″ long 9½″ wide
Centre to centre of pulleys	72″
Idler Pulley	10″ dia. x 9″ face
Floor Space	8′ x 3′ 6″

Jackson, Cochrane & Company

Manufacturers of Woodworking Machinery. : KITCHENER, ONTARIO

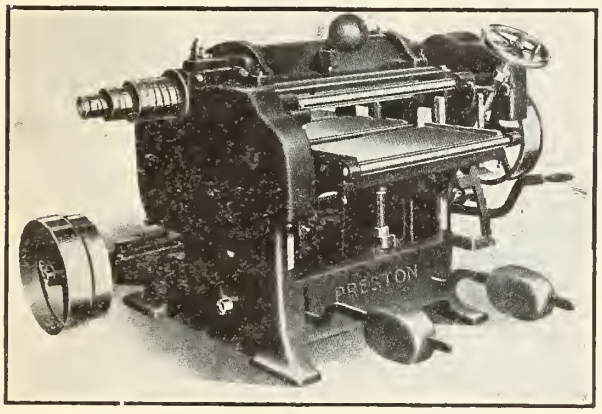
"Preston" Woodworking Machines Mean



No. 123 "Preston" High Speed Ball Bearing Surface Planer

This cut shows planer equipped with specially selected S.K.F. ball bearings, sectional roll, and sectional chipbreaker, round cylinder with four high speed knives, and arranged to receive Stockridge electric knife grinder and jointer. Cylinder speed, 5,000 R.P.M.

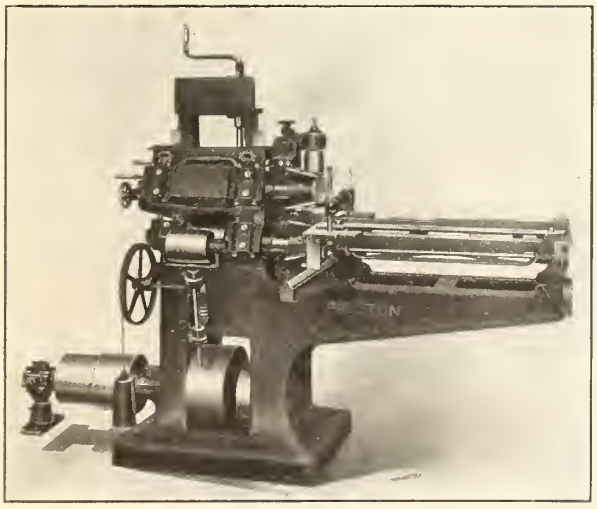
Two points are guaranteed: (1) It will reduce your sanding costs (2) It will increase your production.



No. 121 "Preston" Heavy Pony Planer

This cut shows standard machine. Can be built with:

(1) Straight roll or divided rolls or sectional roll and chipbreaker.
(2) Square cylinder or round 4 knife cylinder.
(3) Babbit Bearings or S.K.F. Ball Bearings.



No. 184 "Preston" Tenoning Machine

Features of Construction.

(1) Genuine Whitney self-lubricating bearings.
(2) Powerful belt drive.
(3) Large heavy base and very rigid in all parts.
(4) Practically all adjustments made from front of machine.

The Preston Woodworking

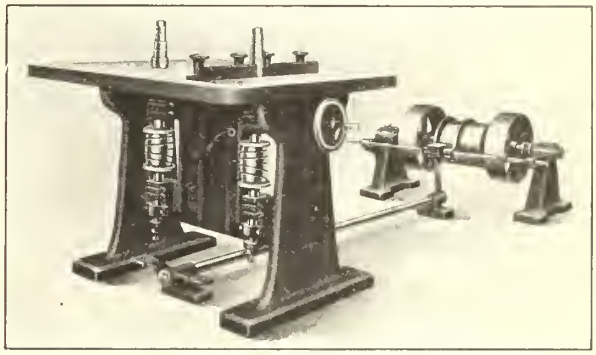
PRESTON,

We are Sole Manufacturers of and Agents in Canada for the Eaglesfield Patented Beltless Swing Saw

arger Output and Lower Expense

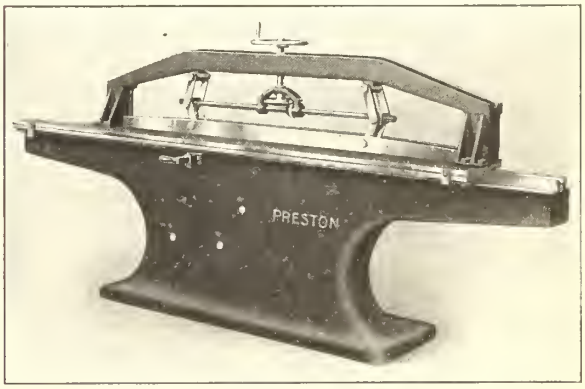
No. 164 "Preston" Ball Bearing Shaper

Designed to meet the requirements of concerns needing a lighter and less expensive Shaper than our No. 162.
Made with:
(1) Babbit bearings, plain countershaft.
(2) Ball bearings, plain counter-shaft.
(3) Ball bearings, special countershaft.



No. 181 "Preston" Veneer Jointer

The only veneer jointer that will effectively joint buckled veneer. Designed for the purpose of making commercially perfect face joints, butt or crosswise, as well as lengthwise of the grain on the highest figured Circassian Walnut or Crotch Mahogany Veneer. As rigidity is an essential feature of this type of machine, special care was taken in its construction. The frame, which is of cored section, is cast in one solid piece.

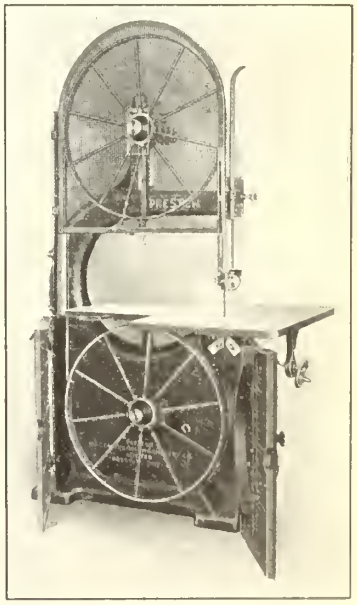


Eaglesfield Patented Ball Bearing Motor-driven Beltless Swing Saw

The special features of this saw are evident from the illustration. The motor is attached directly to the saw mandrel, which is supported in S.K.F. ball bearings. No belts or gears are used and the saw may be hung anywhere, regardless of the position of the shafting.

No. 132 "Preston" 36″ Band Saw

Made with or without guards. The wheels are all steel, covered with solid rubber bands, ¼ in. thick. Solid web lower wheel is supplied when desired.
We guarantee that breaking of saws will be reduced to a minimum on this machine by reason of our almost perfect tension device and style of guide.
Supplied with 3 H.P. motor for individual drive if desired.



Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

Alphabetical List of Advertisers

Adjustable Clamp Co. 103
Atlantic Lumber Co. 48
Atkins & Co., E. C. 113
Atlas Mfg. Co., of Orlando 30

Batavia Clamp Co. 103
Banning, Leland G. 49
Behr Co., Inc. Herman 27
Bigelow-Cooper Lumber Co. 43
Barr-Holaday Lumber Co. 35
Bell Machine Co. 26
Birds Eye Veneer Co. 78
Black Bros. Co. 102
Blocksom & Company 71
Bruce Woodworkers Ltd. 31
Bruce Company E. L. 38
Brown Corporation 34
Buffalo Hardwood Lumber Dealers 42
Bury & Co., Robt. 50

Canada Machinery Corporation 6
Canada Wood Specialty Co. 46
Canadian Appraisal Co., Ltd., The 21
Canadian Blower & Forge Co. 112
Canadian General Lumber Co. 99
Canada Glue Co. 18
Canadian Powers Regulator Co. 4
Canadian Nashua Paper Co. .....
Canadian S. K. F. 105
Cannon Canadian Co., Ltd. 18
Connor J. H. & Sons Ltd. 46
Carborundum Co. 107
Carter & Co., E. T. 76
Casein Mfg. Co. 18
Celluloid Zapon Co. 76
Chapman & Dewey Lumber Co. 32
Clamp Nail Co. 103
Clark Edward & Sons, Ltd. 44
Coignet Chemical Products Co. 18
Colborn, C. B. 40
Comfy Cushion Co. 71
Cosmos Chemical Co. 21
Cowan & Co. 1
Cutler Desk Co. 4

Decorators Supply Co. 20
Delaney & Pettit Limited 72
Des Moines Sawmill Co. 36
DeVilbiss Mfg. Co. 77
Dominion Appraisal Co. 21
Dry Kiln Door Carrier Co. 102

Eagle-Ottawa Leather Co. 71
Eaton & Sons J. R. 39
Engineering & Machine Works of Canada Ltd. 110

Farrin Lumber Co., The M. B. 50
Fay & Egan Co., J. A. .....8..... 2
Foster, Merriam Co. 22
Garlock Machinery Ltd. 3
General Machinery Co. 101
General Hardwood Lumber Co. 31
Globe Vise & Truck Co. 109
Grand Rapids Vapor Kiln 13
Guelph Patent Cask. Co., Ltd. 87
Gulf Lumber & Trading Co. 41

Hardwood Mfg's. Institute .....
Hafner Mfg. Co. 46
Hartzell, Geo. W. 37
Hay & Co. 95
Hay & Co., Peter 101
Hawker Mfg. Co., W. S. 25
Hoffman Bros. Co. 85
Hyde Lumber Co. 40

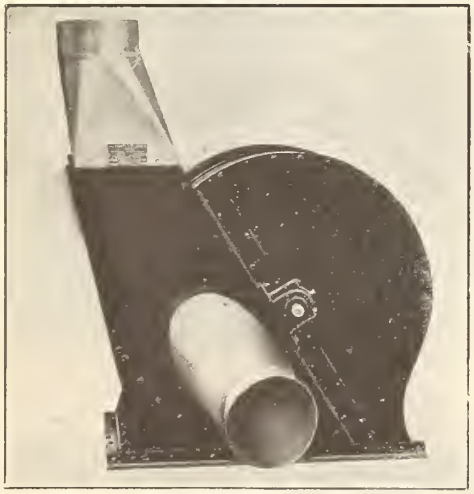
Ideal Fence & Spring Co., of Canada Ltd. 72
Industrial Engineering Co. 112

Jackson Cochrane & Co. 9

Kane Mfg. Co. 20
Kasebier Chatfield Shellac Co. 102
Kinnon Lumber Co. 101
Klise Mfg. Co. 24
Klotz Machine Co. 38
Kosse, Shoe & Schleyer Co. 41
Kraetzer-Cured Lumber Co. 97

First Cost Vs. Final Cost

What does it cost to install a Blower System?



THE FOSTER FAN

is installed complete. No part of the installation is re-let. We have in our employ only the most skilled mechanics and all our work is erected by them. We assume the entire responsibility.

That depends.

The first cost of a job is not necessarily the real cost. A "cheap" or "low priced" installation may be very costly when you figure the trouble and additional expense through break-downs and replacements that very often occur.

A job done the "Toronto Blower" way means a good, lasting, satisfactory job. We stand behind our work and guarantee it. An expert engineer of extended experience will gladly estimate on cost of installation.

The Toronto Blower Company

156 Duke St. Toronto

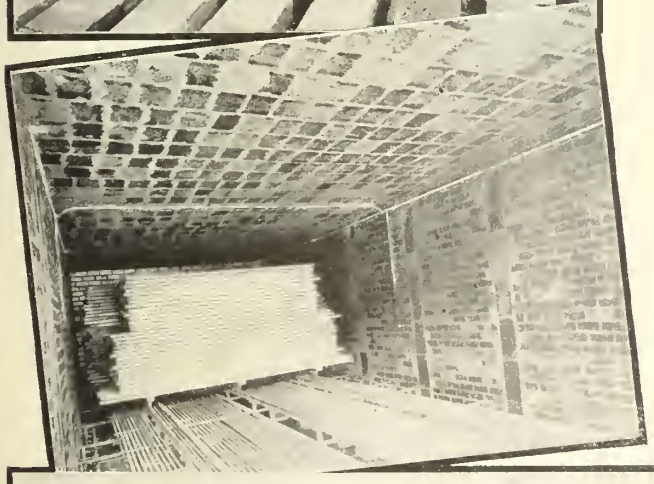
"Free your factory with a Foster Fan"

—and Now PACKARD Endorses

the GRAND RAPIDS VAPOR KILN

These views were photographed during construction and at completion of Packard Battery of 14 Grand Rapids Vapor Kilns designed and installed by us.

3,124 now in use in North America!



IF YOU are in the motor car or car body business it will interest you to know that Packard, Peerless, Pierce Arrow, Cadillac, Fisher Body, the Auto Body Company, Republic Truck and a score of other leaders in the automotive industry cure their wood in Grand Rapids Vapor Kilns.

If you make cameras, caskets, clocks, carpet sweepers, case goods, butcher blocks or zithers—the leaders in your line use Grand Rapids Vapor Kilns almost without exception.

Wm. Cramp & Sons cure lumber for ocean liners in our kilns. Curtis Bros. & Co. dry their famous interior finish in Grand Rapids Vapor Kilns. And so on without end! Complete endorsement everywhere because there is no other method that quite equals Grand Rapids Vapor Kiln results.

We maintain, as the very foundation of our continued leadership, America's most highly specialized and efficient laboratory service serving the woodworking industry. Technical bulletins covering practically every phase of wood curing problems are yours FREE upon request and the personal service of our corps of experts here and abroad is offered without placing you under the slightest obligation. Write us.

GRAND RAPIDS VAPOR KILN

Engineers, Manufacturers, Contractors

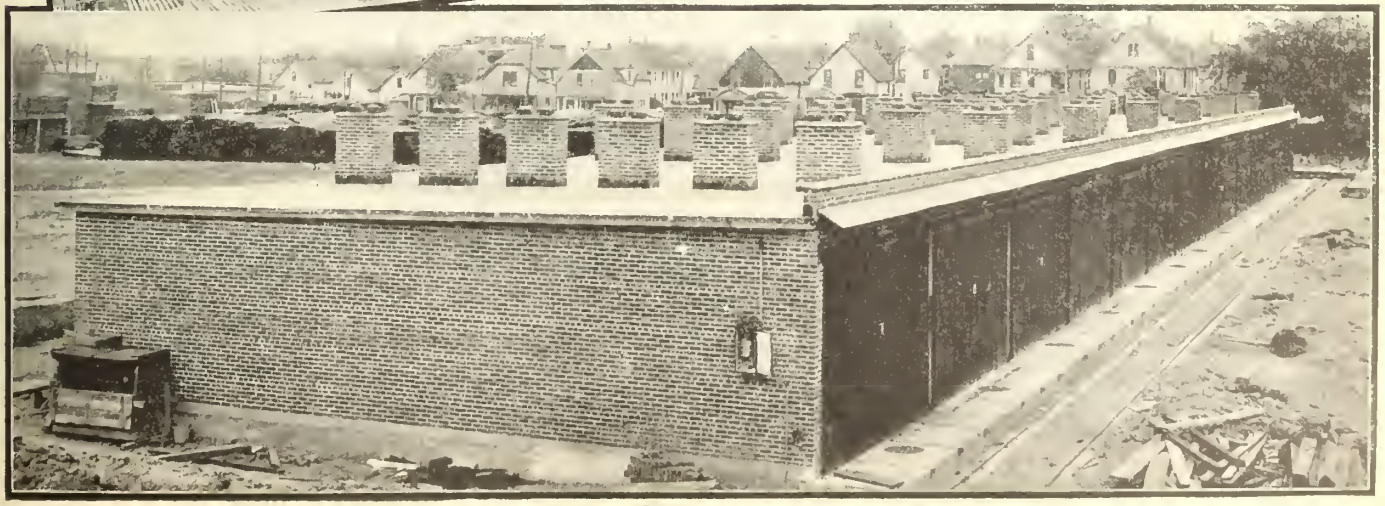
Main Office and Factory: GRAND RAPIDS, Mich., U. S. A.

FOREIGN OFFICES:

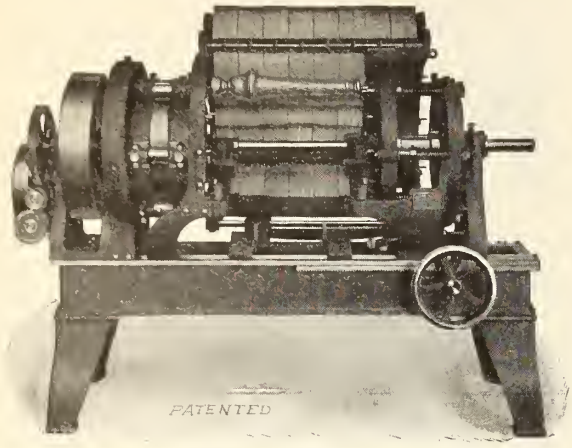
BOORMAN & BOORMAN
Sidney, Australia

THE OLIVER MACHINERY CO.
Manchester, England

A. R. WILLIAMS MACHINERY CO.
St. John, N.B.



WHY HESITATE



to purchase an equipment which can save its cost in less than a year?

That is the record of the Nash Sander for furniture turnings.

Let me give you details

J. M. NASH, Milwaukee, Wis.

We Manufacture a complete line of

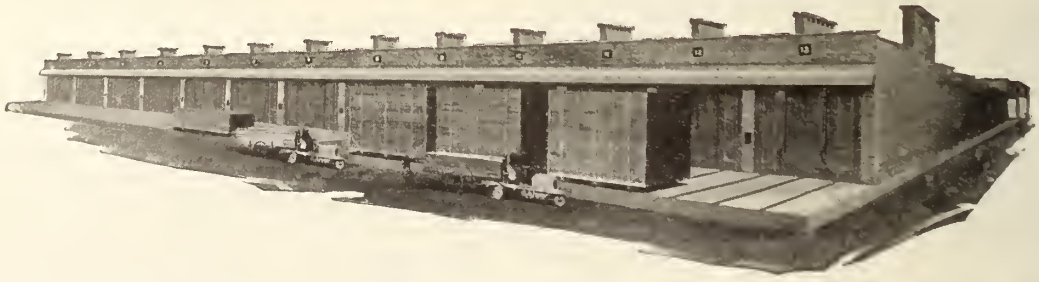
Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.

WHEN consumers want kiln dried lumber and want it "right," they specify one of the many plants using.

THE STANDARD
Dry Kiln — for Example



Thirteen New Standard Kilns at plant of M. B. Farrin Lumber Company, Cincinnati, O., which has used "The Standard" for years. They are the very latest in modern drying equipment. Installed by a firm widely known for the large amount and varied kinds of high-grade commercial drying which it does to the satisfaction of many kinds of consumers. If interested in drying get on our mailing list. Address The Standard Dry Kiln Co., 1542 McCarty St., Indianapolis.

1922 --- OCTOBER - NOVEMBER - DECEMBER -- 1923

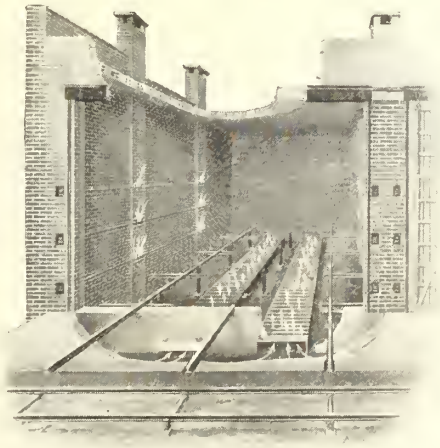
Three Months Until the New Year Arrives

Are you ready for a Bigger and a Better year's Production?

NATIONAL AUTOMATIC HUMIDITY CONTROLLED DRY KILNS installed NOW will assure you perfectly conditioned lumber. They are the fruit of over twenty years' experience in the designing, operating and manufacturing of lumber kilns by the best dry kiln engineers obtainable. Nationals owe their success to the constant research made by these engineers, and the executing of improvements to meet the new phases in the scientific application of their findings, as applied to the practical use of kilns. As a result NATIONALS have become the most perfect, practical drying apparatus on the market.

When installing a National you are not experimenting,—all experiments have been made at our expense. You are guaranteed absolute satisfaction in the production of cured lumber of the highest quality.

Business is daily growing in volume and all indications point to better conditions. Are your dry kilns adequate to handle a bigger and a better production during the coming year? If not, NOW is the time to bring them up to the desired standard. Whether it is a question of new kilns or the remodeling of the old, our engineering services are free. Kindly write us full details as to your problems and we will be pleased to respond. This will not obligate you in any way.



"The First Kiln in 6000 Years in which Humidity is Automatically Controlled"

The National Dry Kiln Company

1117 East Maryland Street Indianapolis, Indiana

C. A. FIELDS, Canadian Representative, P. O. Box 55, Toronto, Ontario

NATIONAL DRY KILNS

Alphabetical List of Advertisers—Continued

Laidlaw Bale-Tie Co. 30
Larson & Shaw Ltd. 102
Litton Veneer Co. 81
Long-Knight Lumber Co. 95
Luehrmann Hardwood Lumber Co. Chas. F. 34

Marietta Paint & Color Co. 72
Mattison Machine Works 114
May Hardwood Co., R. R. 34
Maus, Chas. O. Lumber Co. 34
McDonagh Lumber Co. 39
McKenzie Machinery Co., D. 16
McKnight & Son Co., L. G. 14
Memphis Bandmill Co. 25
Memphis Veneer & Lumber Co. 85
Mercereau Hawkins Tie Co. 38
Mohawk Veneer Co. 85
Monite Glue 19
Morgan Machine Co. 111
Mowbray & Robinson 49
Murrelle Lumber Co., L. D. 41

Nash, J. M. 14
National Dry Kiln Co. 15
Nichols & Co., A. S. 77
Nickey Bros. 83-84
Northwestern Cooperage & Lumber Co. .. 81

Oakey & Sons, John 102
Ober Manufacturing Co. 103
Ohio Veneer Company 81
Oliver Machinery Co. 112
Oriental Textiles Co. .....
Otis Mfg. Co. 45
Overton, S. E. 24

Pannill Door Co. 29
Pedwell Hardwood Lumber Co. 47
Penrod-Jurden Co. 86
Penrod Walnut & Veneer Co. 86
Perkins Glue Co. 17
Petrie Ltd., H. W. 109
Pettingell Machine Co. 101
Pickrel Veneer Co. .....
Porter Machinery Co., C. O. .....
Preston Woodworking Mach. Co. 10-11

Radcliff Saw Mfg. Co. 113
Reese-Sheriff Lumber Co. 43
Richards Hardwood Co. 31
Richards-Wilcox Canadian Co. 101

Shantz, P. E. 32
Shimer Cutter Head Co. 7
Shurley Dietrich Co. 7
Sidmans of Canada, The 99
Simonds Canada Saw Co. 28
Sondheimer Co., E. 47
Standard Dry Kiln Co. 14
Standard Veneer Co. 85
Stark & Co., Jas. E. 39
Steele & Hibbard Lumber Co. 39
Stimson & Co., J. V. 40
Stimson Hardwood Co., J. V. 33
Stimson Veneer & Lumber Co. 33
Sturtevant Co., B. F. 30
St. Joseph Iron Works 111

Taylor Mfg. Co., Jas. L. 109
Toronto Blower Co. 12
Toronto Veneer Co. 93
Toronto Hardwood Lumber Co., Ltd. 93

Vandergrift & Morris 39
Veneer Manufacturing Co. 87

Waddell Mfg. Co. 24
Walter & Sons, J. 23
Watertown Table-Slide Co. 32
Willey Co., C. L. 91
Williams Machinery Co., A. R. 8
Williamson Veneer Co. 88
Wisconsin Veneer Co. 81
Wood Mosaic Co. 89
Wylie Mathew 8

Yates Machine Co., Ltd. P. B. 5-29
Yellow Poplar Lumber Co. 48
Young Lumber Co., Bedna 40

McKenzie

Cross-cut, mitre and rip Saw No. 2

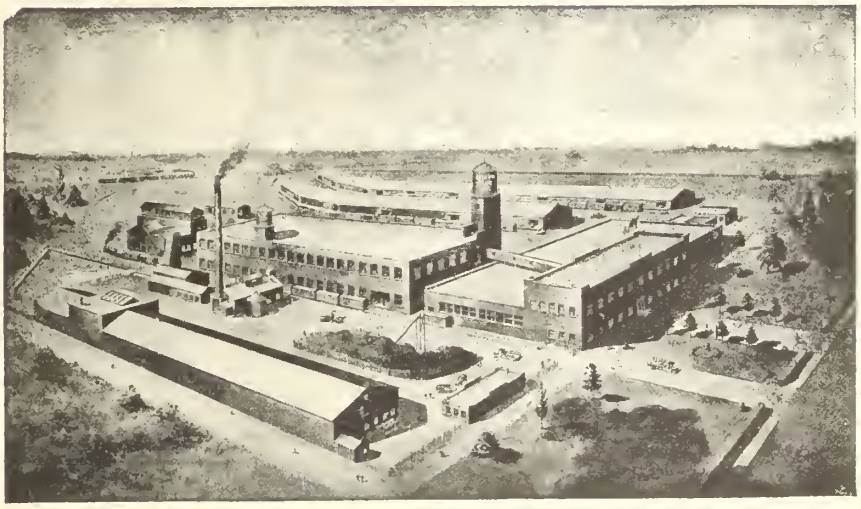
All iron frame and table, accurately machined and fitted insuring good work.

A light inexpensive machine, handy and simple to operate and one which will turn out a great variety of work.

Sold complete as shown or without drilling attachment which is used by manufacturers of beekeepers' supplies. For further particulars apply to any reliable machinery dealer or to the manufacturers.

D. McKenzie Machinery Company, Guelph, Ont.

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.



General Office and Factory

SOMETHING YOU ALREADY KNOW

You are fully and permanently protected in adopting Perkins Glue

Our manufacturing process is the secret of the standard quality and uniformity of our product — the kind preferred by most manufacturers of Plywood construction. There are no comebacks where Perkins' Glue is used.

Patents covering Perkins Glue have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy, and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office:
South Bend, Indiana.

"WHAT WE GLUE WE HOLD"

MADE IN CANADA
BY
CANADA GLUE COMPANY
LIMITED
BRANTFORD, ONT.

UNIFORMITY

When used in describing a **Cannon Glue** is more than a claim. It is an established **fact!**

We have customers in Canada who have used one brand for fifteen to twenty years without one cause for complaint.

CANNON CANADIAN CO., LTD.
TORONTO MONTREAL

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

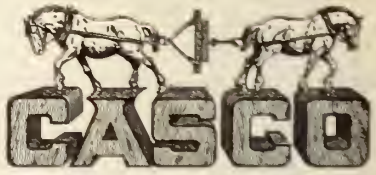
Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY
17 State Street NEW YORK CITY

"Casco" for better product

YOUR confidence in your product is shared by your customer when he knows that

Write for "CASCO" Red Book—a manual on Veneers, Panel-making and Glue. Samples of "CASCO" on request.



WATERPROOF GLUE
grips the Veneers or the joints.

"CASCO" is
Incredibly Strong
Mixed in Cold Water
Most Economical

Casco-made woodwork can be subjected to extreme variations in temperature and moisture without fear of separation.

The Casein Manufacturing Company
Largest and Longest Established Manufacturers of Casein Products in America
15 PARK ROW, - NEW YORK CITY

Table made by Hastings Table Co., Hastings, Mich. Several of these tables went through the Pueblo flood undamaged, tho' under water for two days. Made with MONITE WATERPROOF GLUE.

Monite
Waterproof Glue

Endures Soaking, Steaming, or Baking

MONITE STICKS TO ITS JOB.

Withstood the Flood at Pueblo

"During the flood in Pueblo, Colorado, some of these tables in basements were entirely covered with water for a day. When they were taken out and wiped off they were sold as new.

"The ends, top and base are veneered. We use **Monite Waterproof Glue** in veneering up this table and have **never had any complaints about the gluing.**"

—Hastings Table Co., Hastings, Mich.
Letter of Oct. 25, 1921

Seldom does furniture or plywood have to undergo two days of soaking under water—but it does undergo changing conditions of moisture and heat with every change of the weather.

What flood-water does in a few hours, atmospheric moisture does in a few months or years—and then there is loose and peeling veneer and "dried-out" or "soaked-out" loosened joints.

MONITE WATERPROOF GLUE endures extremes of heat and cold just as it withstands immersion in flood-water. Plywood and joints glued with **Monite** endure—a point highy valuable to manufacturers of glue-made products, their dealers, and the buying public.

Monite Waterproof Glue panels have withstood 8 hours steaming, a week of soaking and all the baking that wood can stand.

Write for one of our small vest pocket panels of plywood made with **Monite** and test it yourself.

MONITE WATERPROOF GLUE CO.

Manufacturers of Cold Glue in Powdered Form

114 17th Avenue, North, Minneapolis, Minn.

Cable Address: Monite-Minneapolis

STOCKS AND REPRESENTATIVES IN ALL PRINCIPAL CITIES

KANE VEGETABLE GLUE

We never cheapen the quality of our product in order to make low prices that cannot pay for first quality material and work.

Also

Kansine Waterproof Glue

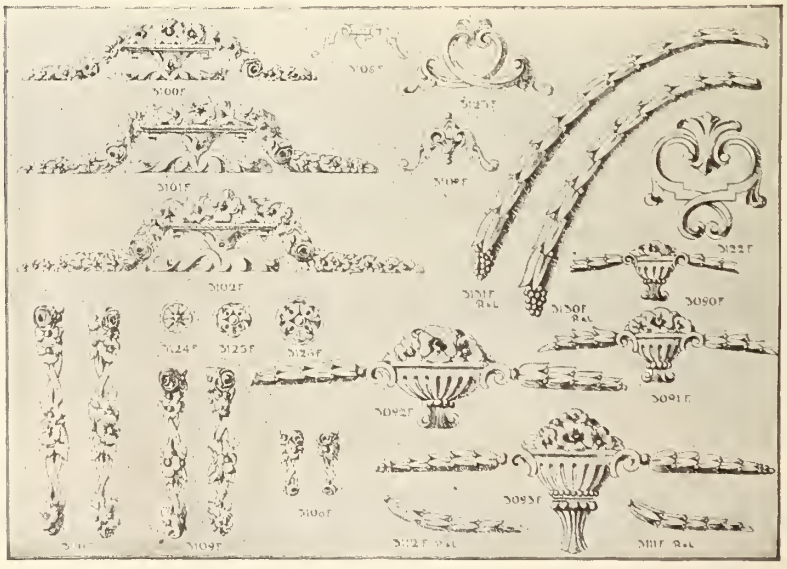
Manufactured exclusively by

KANE MANUFACTURING CO.

1832-34 South Clark Street CHICAGO, ILL.

PERIOD CARVINGS *for* FURNITURE

Largest Manufacturers of Imitation Wood Carvings in the World Quality the Best. Prompt Shipments



Unlimited Facilities for Manufacturing High Grade Wood Carvings in Composition and Wood Fibre

Reproductions of Exclusive Designs Our Specialty

THE DECORATORS SUPPLY CO.

2543 ARCHER AVENUE, CHICAGO

New Catalog Sent on Request

A Better FINISH

You can improve the appearance and durability of your finishes and increase the saleability of your furniture by using

Cosmos High Grade Lacquers and Lacquer Enamels

Lacquer gives a permanent, waterproof surface that is tough and durable.

It dries rapidly, increasing the output of the finishing department. Successive coats may be applied at half-hour intervals, enabling work to be finished in one day.

Samples, prices and other particulars gladly furnished.

Our Specialties:

METAL LACQUERS
WOOD LACQUERS
ENAMELS
BRONZING LIQUIDS
EUREKA AIR BRUSHES
AMYL-ACETATE
REFINED FUSEL OIL
COLLODION
BRONZE POWDERS
MATCHLESS METAL POLISHES AND BUFFING COMPOSITIONS
BANANA OIL

Cosmos Chemical Company
Port Hope Ontario

The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5.000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

Dominion Appraisal Company Limited

The Test of An Appraisal

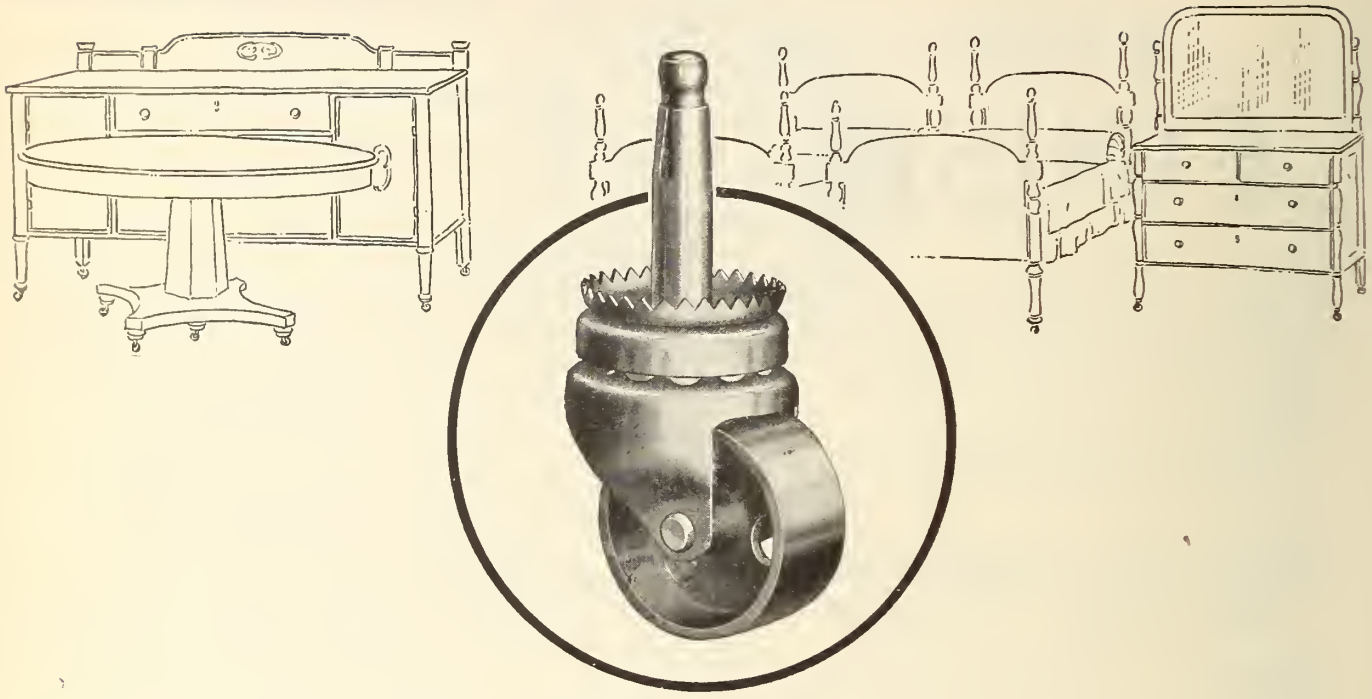
"We have never been so grateful for anything we have done as for the appraisal made by you in December 1919. It certainly was worth thousands of dollars to us in the adjustment of the fire."

Port Arthur Daily News Limited
May 5th, 1921

Our staff of qualified appraisers—men with many years experience in the appraisal field—and our system of careful supervision of all work entrusted to our care has afforded protection to our large clientel extending throughout the Dominion of Canada.

We solicit your correspondence

8-10 Wellington Street East
TORONTO, ONT.
Telephone Main 646.



Efemco

Give tribute where due.

Fine furniture—fine casters —a superfine combination.

And good furniture merits Efemco Casters.

They're appreciated and go to make up that definite something that creates full satisfaction and additional purchases.

They insure economy, appearance and service.

There is an Efemco Caster for every use.

Acme Grip Neck and Plate Casters
Atlas Plate Roller Bearing Casters

Send for our latest catalog

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters
Roller Bearing Casters

Washing Machine Casters
Truck Casters

Piston Rings
Grey Iron Castings
Automobile Accessories

Standardized by 57 years of service

Two Definitions—Which Is Most Practical

FOR YOU TO USE?

Compo or Composition Carvings:—A puddy like compound made up of whitening, glue and rosin, is **not** immune to atmospheric conditions. Is **not** fiberous in nature. Has little or no grain. Is **not** sharp in detail. Can **not** be guaranteed against chipping. It is **not** immune to cracks due to expansion and contraction. Does **not** stain like **wood**. Should **not** be found on good furniture.

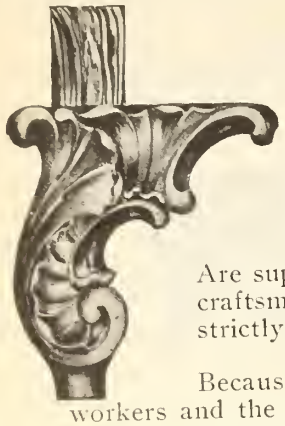
Keep up the spirit of the times, properly decorated furniture will always be in vogue. Do not kill Period Furniture by decorating the same with unreliable carvings.

"Fibro" Wood Carvings:—A reliable wood product. The result of years of diligent effort. Inspired entirely because of the short-comings of puddy carvings. Having all the grain effects of wood, sharp in detail, and truly artistic, all the qualities for absorbing stain and taking on a wood like finish. Last but not least a Canadian product.

Make Canada prosperous by buying Canadian products

JOHN WALTER & SONS LIMITED

KITCHENER :-: ONTARIO



OVERTON

FINE

Leg Carvings

Are superbly designed by leading craftsmen. The workmanship is strictly high grade.

Because we have a staff of skilled workers and the most improved machinery we are able to turn out excellent workmanship in large quantities on short notice.

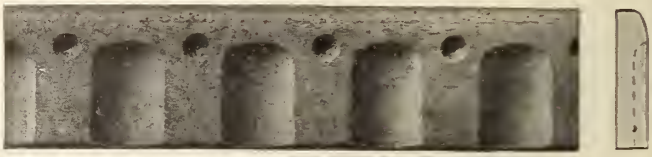
Our designing department is at your service. We will reproduce your own designs with perfect fidelity.

Write for full information.

S.E. OVERTON CO.
"Our Quality Is Always Higher Than Our Price"
ARTISTIC WOOD CARVINGS

South Haven, Michigan, U.S.A.

CARVED MOULDINGS, CARVINGS, CARVED LEGS

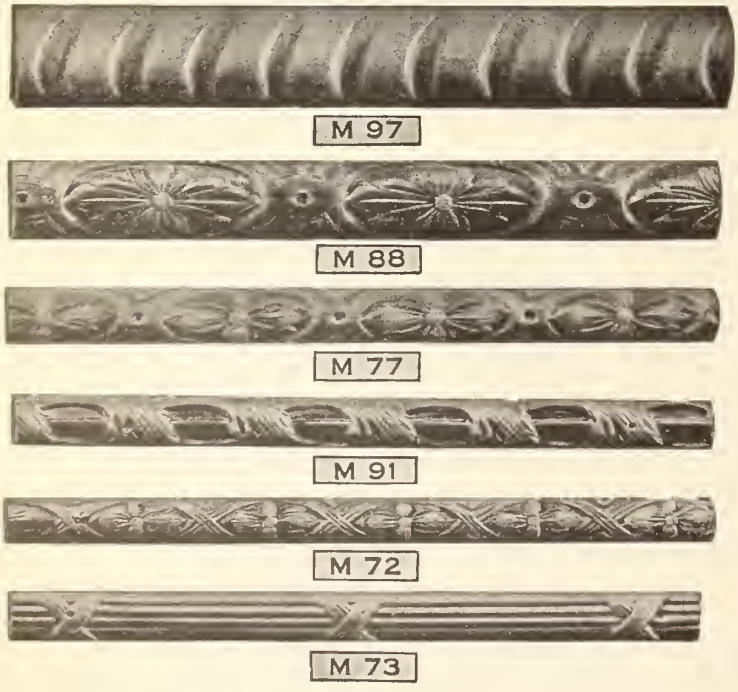


No. D-775 (Reduced One-Half)

No. D-763 (Reduced One-Half)

"KLISE" mouldings are carved, not pressed. Made in several hundred classic, period designs, in various sizes and shapes.
Catalogue of legs and samples of mouldings sent on request. Send us your designs or samples of carvings for quotation.

KLISE MANUFACTURING COMPANY
Grand Rapids, Michigan



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

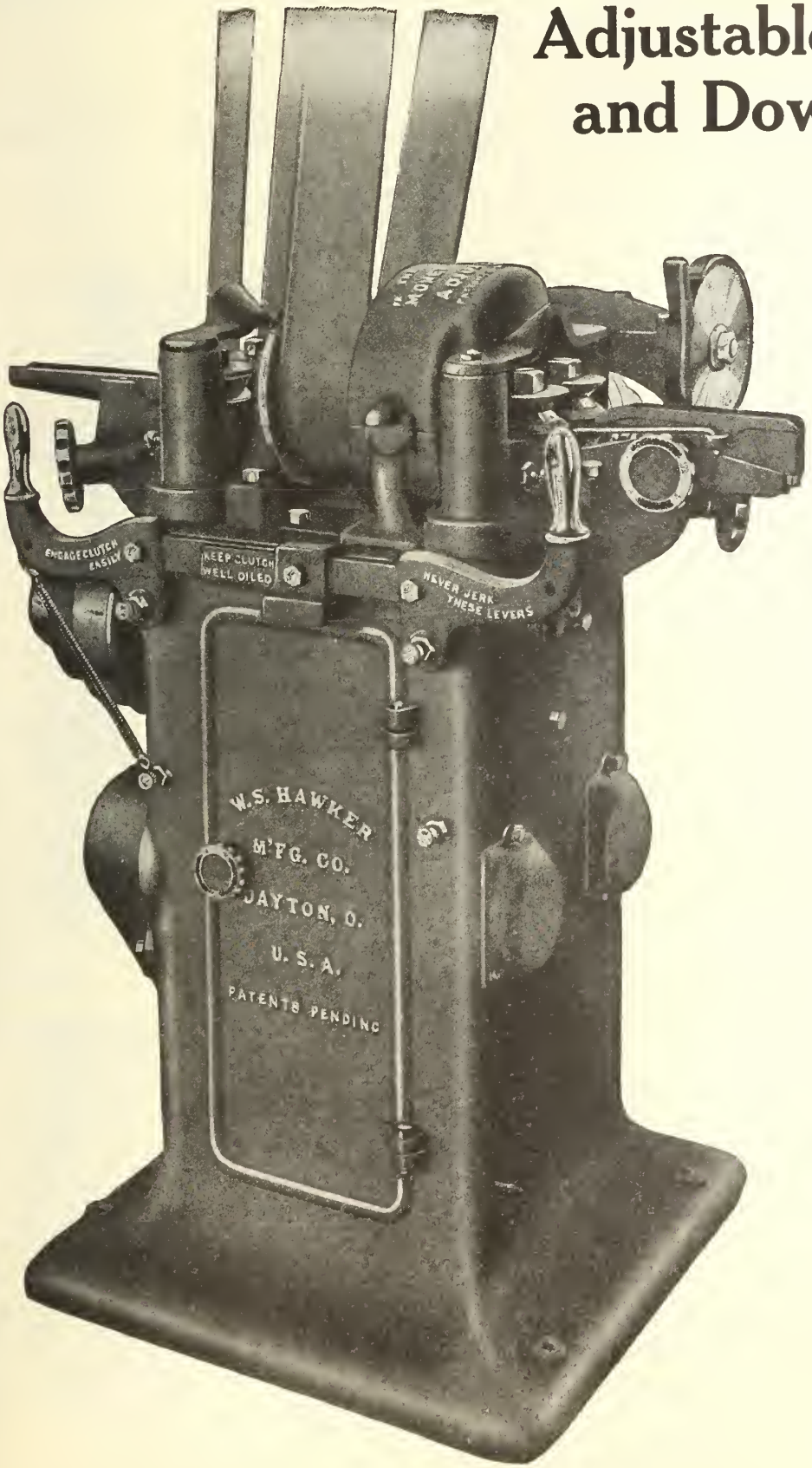
KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

Waddell Manufacturing Company

Coldbrook and Taylor, N. W. Grand Rapids, Mich.

The Money Maker— Adjustable Rod and Dowel Machine



Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

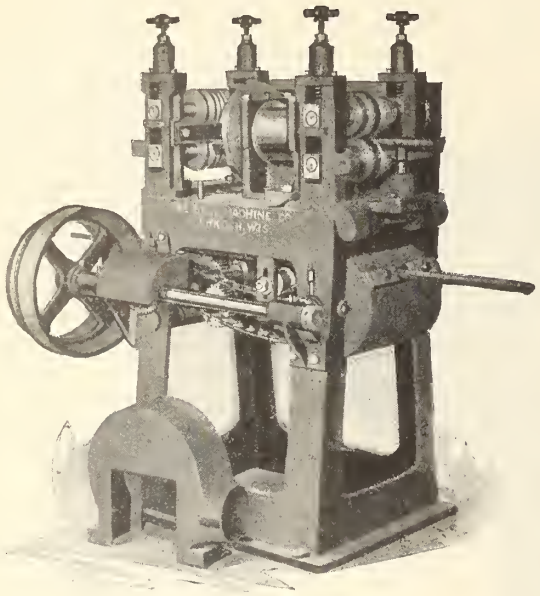
The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely
Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio

Make Your Own Dowels With the "BELL" Machines

The Fastest and Most Practical Equipment For the Purpose



Adjustable Rod and Dowel Machine

The fastest dowel machine in the world.

Constructed to withstand the heavy and constant strain to which this type of machine is subjected.

Equipped with a universal four-knife cutter head adjustable to turn rods of all diameters from ¼" to 2" in either plain, spiral groove, longitudinal groove, or imitation reed wind. Special machine for turning rods of larger size.

Cutter-head mandrel is mounted at each end in ball-bearings of the highest grade.

Out-going feed rolls have combination of grooves so that many sizes can be made without changing feed rolls. The in-going feed rolls are adjustable for all sizes of squares.

Will work stock as short as 4½ inches.

Furnished with countershaft or motor drive.

Dowel Cutting Off and Pointing Machine

This machine is for cutting off and pointing dowel pins from long rods.

It will cut and point dowel pins of all diameters up to ¾", and in any length up to 6 inches.

Capacity of this machine is from 300 to 400 pins a minute. Any boy can operate it.

All working parts are completely enclosed and thus protected from dust and dirt.

Absolutely no danger to operator.

The floor space required by this machine is only 22" x 36".

Tight and loose pulleys on machine.

Furnished with belt or motor drive.

MANUFACTURED BY

The Bell Machine Company

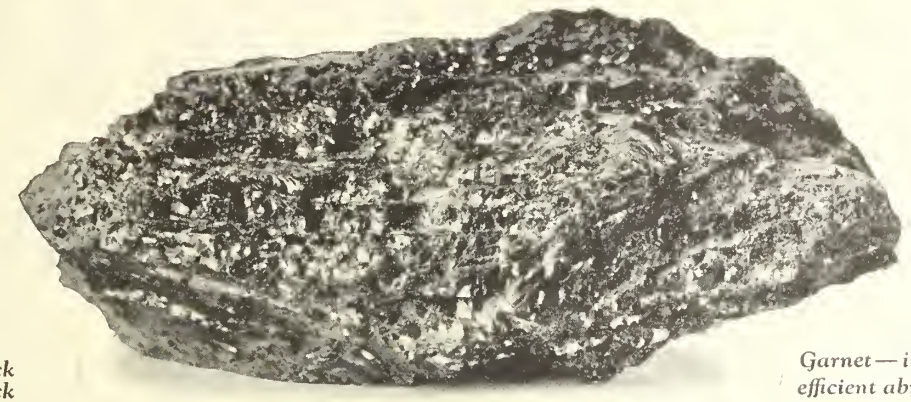
(Successors to the Dauber-Bell Machine Co.)

Oshkosh, Wisconsin, U.S.A.

Representatives:

For Great Britain: THE OLIVER MACHINERY CO., 201 Deansgate, Manchester, England

For Canada: THE A. R. WILLIAMS MACHINERY CO. LTD., Montreal, Toronto, Winnipeg



Adirondack Garnet Rock

Garnet — indisputably the most efficient abrasive for hardwood sanding and finishing.

The Supremacy of Garnet

Garnet is not only sharp but hard enough to resist longer than any other abrasive the continuous wear on such woods as oak, walnut, birch, maple, etc. It has a real affinity for the vast majority of sanding operations, combining just the right degree of sharp cutting and lasting qualities.

Herman Behr discovered the superior qualities of crushed Garnet and first introduced it for work on wood and leather in 1879.

Since then his untiring efforts have given to the woodworking industries Garnet abrasive coated products that have gained and held the confidence of thousands of manufacturers.

Care and disregard of cost in the selection of only the best raw materials, scientific methods of manufacture, constant attention to details of refinement, and skilled workmen with decades of experience are the foundations of Behr Garnet Quality.

Fifty years as manufacturers of sandpapers to meet the exacting demands of direct consumers—the men most interested in whether the goods are high grade and economical—attest the universal approval of Behr Garnet abrasives.

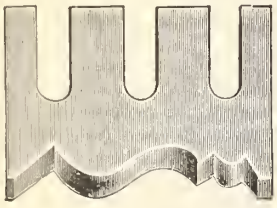
To all those who *know* and *use* sandpaper, the name B E H R signifies the highest attainment in sandpaper manufacture.

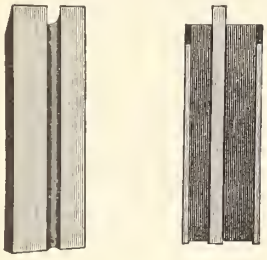
HERMAN BEHR & CO., Inc., 31-63 Tiffany Place, Brooklyn, N. Y.

Chicago San Francisco St. Louis Grand Rapids Montreal
Toronto London Boston

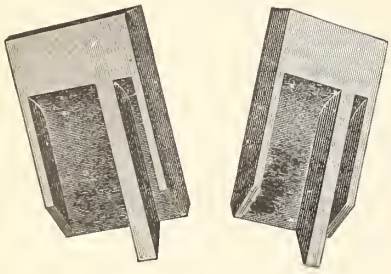
If it's coated with Garnet—Behr makes it!

SIMONDS
Machine Knives



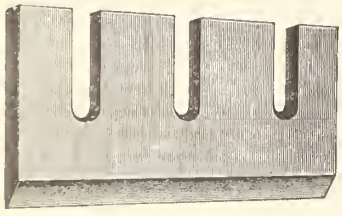


Woodworking shops, the machines of which are equipped with Simonds Knives are getting greater production and longer knife service. The high-grade steel of which Simonds Knives are made is tempered by a scientific method to hold its cutting edge longer and withstand wear.



Every kind of machine knife, as well as Saws which are required in the woodworking industry are produced in one of the five Simonds factories.

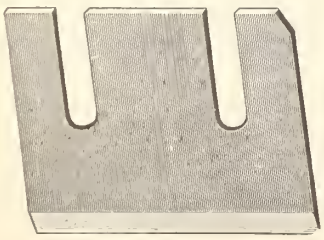
When you require knives send us your inquiries.



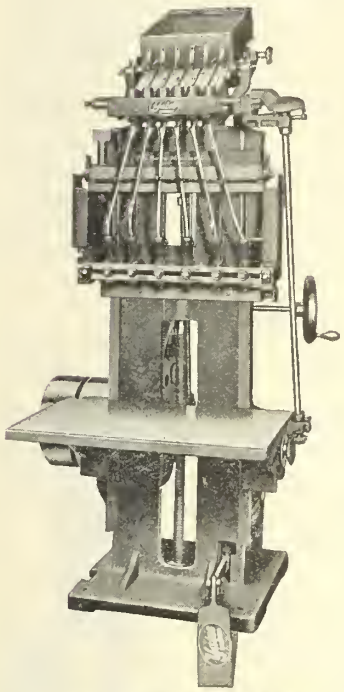
Simonds Canada Saw Co., Ltd.

MONTREAL, QUE.

ST. JOHN, N.B. VANCOUVER, B.C.



YATES
NAILING MACHINES



Entirely Automatic—Quickly Adjustable
Easily Operated

Open and Closed Back Types built
in many different sizes

Ask about our
New A. B. Box Nailing Machine

Nails the sides to end of box simultaneously.
Makes a box in three Strokes.

Don't hesitate to ask for further information. We'll gladly supply it

P. B. Yates Machine Co. Ltd.
Hamilton, Ontario

BIRCH DOORS

We have them in stock—no waiting when you order from us—

ONE PANEL	FRENCH DOORS
2 - 0 x 6 - 8 x 1¾	2 - 0 x 6 - 8 x 1¾
2 - 2 x 6 - 8 x 1¾	2 - 2 x 6 - 8 x 1¾
2 - 4 x 6 - 8 x 1¾	2 - 4 x 6 - 8 x 1¾
2 - 6 x 6 - 8 x 1¾	2 - 6 x 6 - 8 x 1¾
2 - 8 x 6 - 8 x 1¾	2 - 8 x 6 - 8 x 1¾
2 - 10 x 6- 10 x 1¾	2 - 10 x 6- 10 x 1¾

You will find our prices low
and
our service unequaled

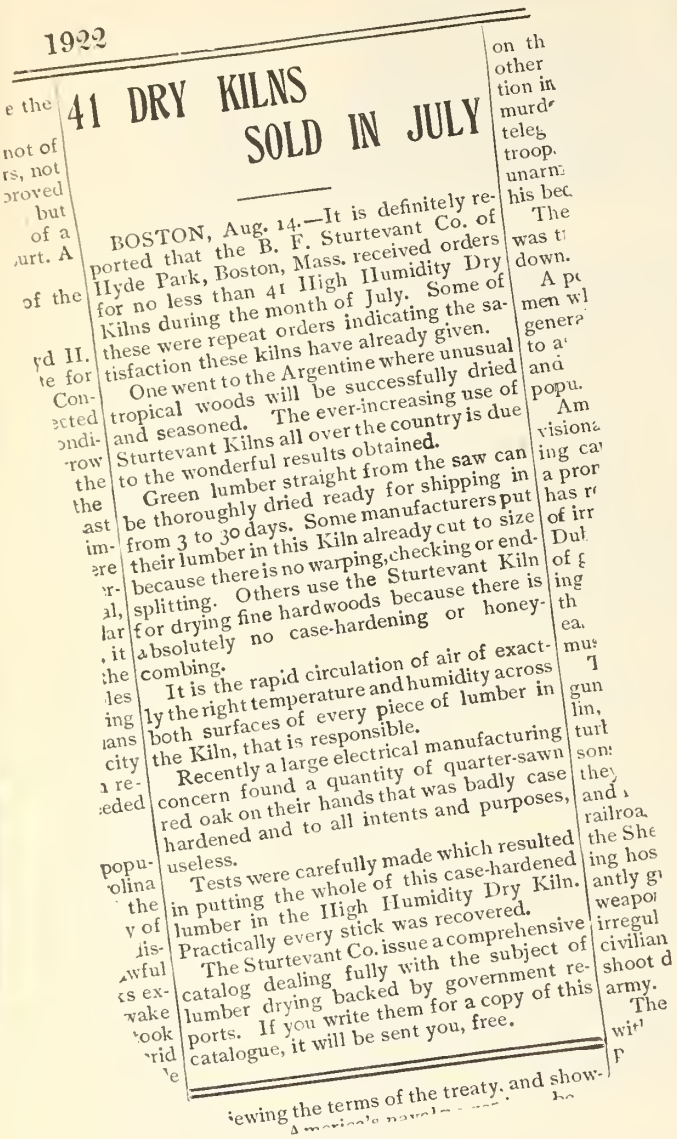
—TRY BIRCH NEXT TIME—

90% per cent of the large expensive buildings such as hotels, office buildings and public buildings are equipped with BIRCH DOORS because the architect specified them, there's a reason for this.

PANNILL DOOR COMPANY LIMITED

131 Front Street East Toronto, Canada

Telephones Main 623-624



1922

41 DRY KILNS SOLD IN JULY

BOSTON, Aug. 14.—It is definitely reported that the B. F. Sturtevant Co. of Hyde Park, Boston, Mass. received orders for no less than 41 High Humidity Dry Kilns during the month of July. Some of these were repeat orders indicating the satisfaction these kilns have already given.

One went to the Argentine where unusual tropical woods will be successfully dried and seasoned. The ever-increasing use of Sturtevant Kilns all over the country is due to the wonderful results obtained.

Green lumber straight from the saw can be thoroughly dried ready for shipping in from 3 to 30 days. Some manufacturers put their lumber in this Kiln already cut to size because there is no warping, checking or end-splitting. Others use the Sturtevant Kiln for drying fine hardwoods because there is absolutely no case-hardening or honeycombing.

It is the rapid circulation of air of exactly the right temperature and humidity across both surfaces of every piece of lumber in the Kiln, that is responsible.

Recently a large electrical manufacturing concern found a quantity of quarter-sawn red oak on their hands that was badly case hardened and to all intents and purposes, useless.

Tests were carefully made which resulted in putting the whole of this case-hardened lumber in the High Humidity Dry Kiln. Practically every stick was recovered.

The Sturtevant Co. issue a comprehensive catalog dealing fully with the subject of lumber drying backed by government reports. If you write them for a copy of this catalogue, it will be sent you, free.

viewing the terms of the treaty, and show-

Send for Catalog 282

Sturtevant
PUTS AIR TO WORK

HIGH HUMIDITY DRY KILN

The Kiln with a circulation you can understand

B. F. Sturtevant Co.

of Canada, Limited

Montreal Galt Toronto

Territorial Representatives

Empire Engineering & Supply Co.
Edmonton, Alberta

Kipp-Kelly Limited
Winnipeg, Man

807

NAILS AND WIRE

For Every Need in the Woodworking Industry

Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

Laidlaw Bale-Tie Co., Ltd.

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

"The Phillips Line"

Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

Atlas Mfg. Co. of Orlando

Orlando, Fla., U. S. A.

Subscribe for the

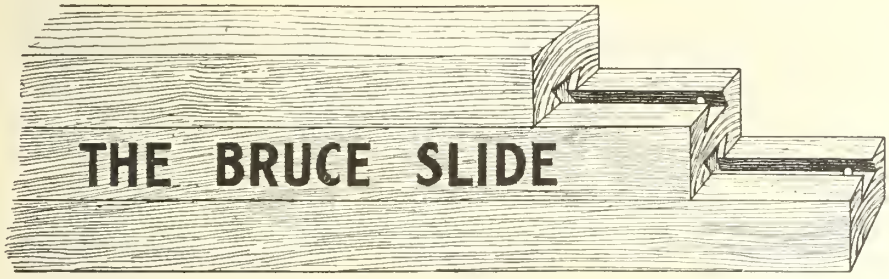
Canadian Woodworker

and

Furniture Manufacturer

Only $2.00 per year

TABLE SLIDES TABLE RIMS TABLE PINS



Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

H. J. RICHARDS J. T. KENDALL

Richards Hardwood Company

746-7 BANK OF COMMERCE BUILDING

Memphis, Tennessee, U. S. A.

Successors to Dacus-Richards Hardwood Co.

We make a specialty of catering to the Canadian trade and are in position to make reasonably prompt shipment of practically any Southern Hardwoods which you are needing. Your orders and inquiries will be highly appreciated and will receive our prompt and personal attention.

Specializing in Delta Red and Sapgum, Oak, Elm and Poplar.

GENERAL HARDWOOD LUMBER COMPANY

SOUTHERN AND NORTHERN HARDWOODS

118 North La Salle Street

CHICAGO

Quick shipments assured, together with quality stocks.

Kindly favor us with your enquiries.

Are You Using
Roller-Bearing Equalizer Table Slides?

These are the most smoothly operating slides on the market. Give absolutely no trouble at all. Let us send you prices and full particulars.

WATERTOWN TABLE - SLIDE COMPANY
Watertown, Wisconsin, U.S.A.

FACTORY TRUCKS

Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY

P. E. SHANTZ, PRESTON, ONTARIO.

Factory Truck Style No. 26.

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK

3	cars	4/4″	Fas.
5	“	4/4″	No. 1 Common.
1	“	4/4″	No. 2 Common.

PLAIN WHITE OAK

2	cars	4/4″	Fas.
2	“	5/4″	No. 1 Com. & Btr.
3	“	4/4″	No. 1 Com. & Sel.
3	“	4/4″	No. 2 Common.

QUARTERED RED OAK

3	cars	4/4″	Fas.
6	“	4/4″	No. 1 Common.
2	“	4/4″	No. 2 Common.

PLAIN RED OAK

2	cars	4/4″	Fas.
3	“	5/4″	Fas.
3	“	6/4″	Fas.
2	“	8/4″	Fas.
8	“	4/4″	No. 1 Common.
2	“	5/4″	No. 1 Common.
2	“	6/4″	No. 1 Common.

QUARTERED RED GUM

2	cars	4/4″	Fas.
2	“	4/4″	Fas. Fig.
2	“	5/4″	Fas.
2	“	6/4″	Fas.
10	“	4/4″	No. 1 Common.
2	“	5/4″	No. 1 Common.
2	“	6/4″	No. 1 Common.

QUARTERED RED GUM S.N.D.

5	cars	5/4″	No. 1 Com. & Btr.
5	“	6/4″	No. 1 Com. & Btr.
10	“	8/4″	No. 1 Com. & Btr.

ASH

4	cars	10/4″	No 1 Com. & Btr.
2	“	12/4″	No. 1 Com. & Btr.
1	“	6/4″	No. 1 Com. & Btr.
2	“	4/4″	No. 1 Common.
2	“	4/4″	No. 2 Common.
2	“	5/4″	No. 1 Com. & Btr.

SAP GUM

8	cars	4/4″	Fas.
3	“	5/4″	Fas.
3	“	6/4″	Fas.
15	“	4/4″	No. 1 Common.
8	“	4/4″	No. 2 Common.
5	“	5/4″	No. 1 Common.
5	“	6/4″	No. 1 Common.

COTTONWOOD

2	cars	4/4″	Fas.
6	“	4/4″	No. 1 Common.
3	“	4/4″	No. 2 Common.

ELM

2	cars	4/4″	Log Run.
2	“	5/4″	Log Run.
1	“	8/4″	Log Run.
6	“	10/4″	Log Run.
6	“	12/4″	Log Run.

Charles O. Maus Lumber Co.

South Bend, Ind., U.S.A.

Southern & Northern Hardwoods

Red Gum (plain or quartered)
Sap Gum (plain or quartered)
Oak (plain or quarter cut)
Ash
Maple
Birch
Southern Elm
Cottonwood
Cypress
Tupelo
Poplar
Walnut
Mahogany

When you think of lumber, think of us.

High Grades Service

Why not give us a trial?

La Tuque Turpentine

Made by an improved laboratory process from Canadian woods.

An excellent thinner for paste, colors, enamels, stains, paints and varnishes.

La Tuque Turpentine contains no free rosin.

The quality is there
The price is right

Write us for particulars

BROWN CORPORATION
56 St. Peter St., QUEBEC, P.Q.

We Want Orders for

Straight or Mixed Cars

Soft Textured Kentucky Oak and Poplar

Stock located where we can get cars and make shipment

R. R. May Hardwood Co.

1522 S. Sixth St. Louisville, Ky.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Ply Wood Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Choice Southern Hardwoods

Carefully Graded Priced Right Shipped Promptly

We are just as anxious to give you the best of service as you are to receive it.

For years we have made a specialty of Gum, Oak and Poplar, supplying many of the leading woodworking and furniture factories both in Canada and the United States.

We beleive we have a good product to offer you and only ask the opportunity to prove it.

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY

Memphis - Tennessee

SERVICE

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

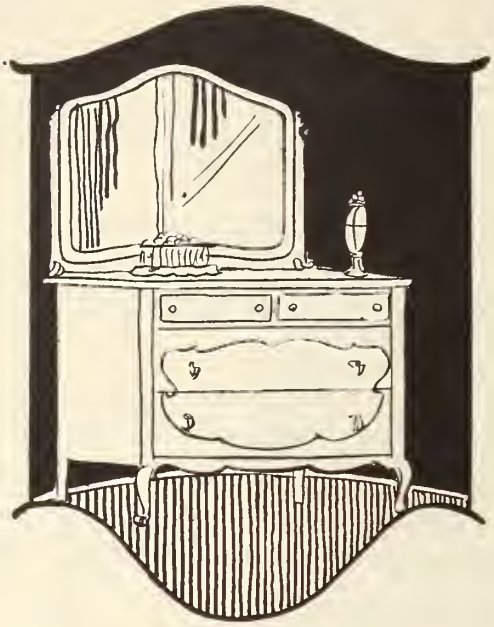
Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

We cut Iowo grown walnut exclusively BOTH Lumber and Veneers



It Makes a Good Product BETTER

The quality of the lumber and the veneers in your product is an integral part of the quality of the product itself. Better lumber means better product—better prices—better sales.

Investigate IOWA Walnut—grown in the deep, rich loam of Iowa corn land it develops a strength and fineness no ordinary walnut can quite match. Cutting in our exclusive walnut mill by men who specialize on walnut brings out every inherent fineness of the native log. Let us demonstrate.

Write or Wire for full information and prices on your needs of walnut lumber and veneers before you buy.

IOWA Walnut Grown on Iowa Corn Land

Des Moines Sawmill Company
1024 Murphy St., Des Moines, Iowa

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

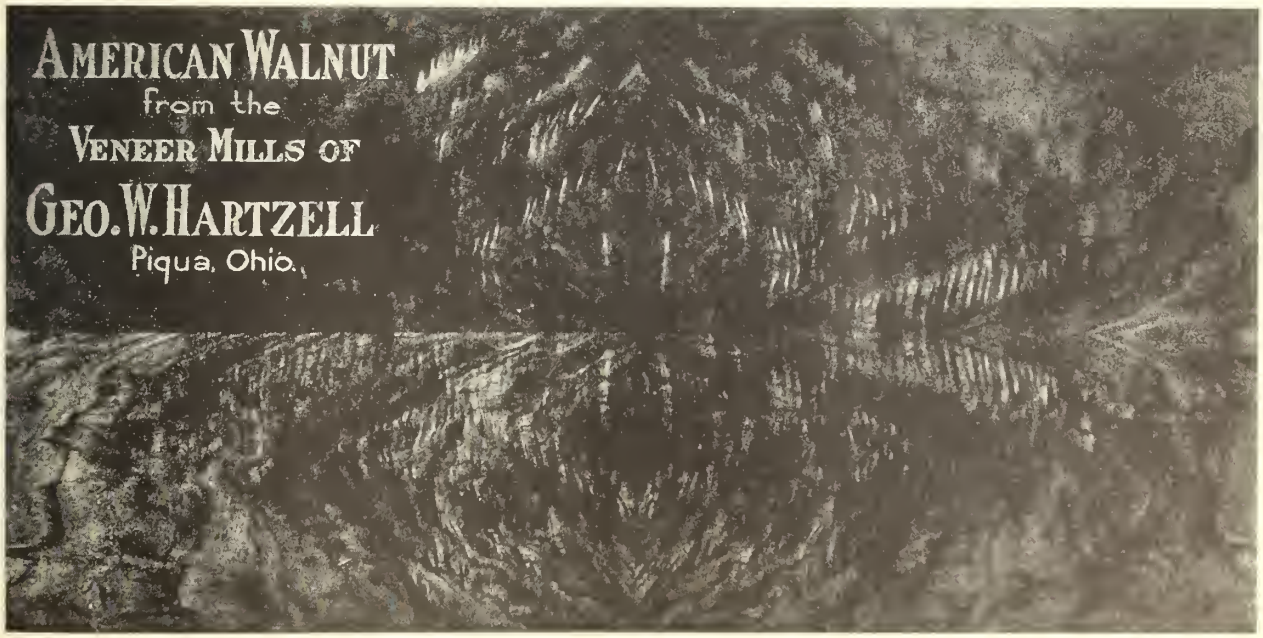
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

Air Dried or Kiln Dried?

Kiln dried stock will mean an advantage to you—a material reduction in weight with a resulting reduction in freight cost. Kiln-drying in our plants means the latest and most improved methods together with efficient handling.

Any of the following items in Southern Hardwoods can be shipped promptly from our band mill at Little Rock, Arkansas. Band sawn in our own mill, dry, good widths and excellent lengths, this stock graded according to National Hardwood Lumber Association rules represents a good value for you.

QUARTERED RED GUM

3	cars	5/4" FAS
1	"	8/4" FAS
1	"	12/4" FAS
3	"	5/4" No. 1 Com. & Sel.
6	"	6/4" No. 1 Com. & Sel.
2	"	8/4" No. 1 Com. & Sel.
½	"	10/4" No. 1 Com. & Sel.

QUARTERED SAP GUM

4	cars	5/4" FAS
1	"	8/4" FAS

QUARTERED WHITE OAK

1	car	4/4 x 10 & wider FAS
1	"	5/4" FAS

QUARTERED FIGURED RED GUM

2	cars	4/4" No. 1 Com. & Sel.

PLAIN RED GUM

½	car	6/4" No. 1 Com. & Sel.

WEIGHTS PER THOUSAND FEET

	Air Dried	Kiln Dried
Oak	4400	4000
Red Gum	3500	3200
Sap Gum	3300	3000

If you do not see just what you want in this list, write us giving your requirements. Our mill is now cutting excellent quality Southern Hardwoods.

E. L. BRUCE COMPANY

MANUFACTURERS

MEMPHIS, TENN.

Band Mill: Little Rock

Oak Flooring Plants: Memphis; Little Rock

Mercereau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

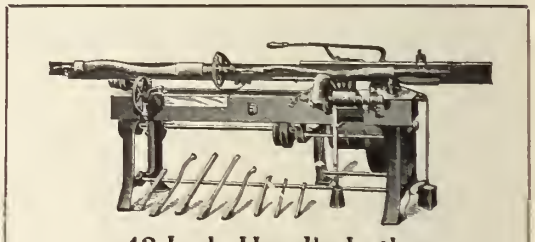
C. W. PETERS

Vice President and Manager of Lumber Dept.

Klotz Machine Co's

Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.

We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY

Klotz Machine Co., Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

Steele & Hibbard Lumber Co.
ST. LOUIS, MO.

56 Years in Business

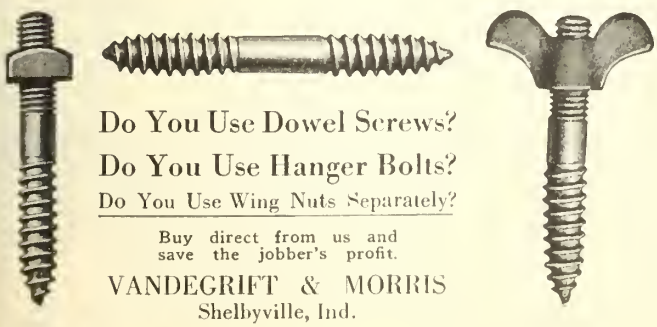
We carry a large stock of dry
Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."



Do You Use Dowel Screws?
Do You Use Hanger Bolts?
Do You Use Wing Nuts Separately?

Buy direct from us and save the jobber's profit.

VANDEGRIFT & MORRIS
Shelbyville, Ind.

McDonagh Lumber Co.
203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods
Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

It Pays to Buy the Best

QUARTERED WHITE OAK

QUARTERED RED OAK

OTHER HARDWOODS

HIGH GRADE

Lumber

Bedna Young Lumber Co.
Jackson, Tennessee

J. V. STIMSON & COMPANY

Hardwood Lumber
or
Hardwood Products

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Our equipment and facilities are most modern in every respect and permit us to offer a service that is unexcelled. Straight or mixed carloads. You will find our soft textured and finely figured quartered-sawn red and white oak particularly attractive.

OWENSBORO - KENTUCKY
Bandmills. Owensboro; Campbellsville, Kentucky

DIMENSION

On hand for immediate shipment

CLEAR WHITE AND RED OAK

1	car	1-¼	x 2 -40"	60%	D
		1-¼	x 2-¼-40"	40%	D
1	car	1-¼	x 2-¼-40"	70%	D
		1	x 2-¼-40"	30%	D
1	car	2	x 2 -24"		M
2	cars	2	x 2 -19"		D
3	cars	2	x 2 -19 & 30"		M
1	car	2	x 2 and 2-½ x 2-½-30"		D
1	"	1-½, 1-⅝ and 2" sq. 19 to 44"			D
1	"	1-¼ x 2-¼-40" 2 x 2-19 & 30"			D
3	cars	2 x 2-30"			D

SAP GUM

5	cars	2-½ x 2-½-30"		D
3	cars	2 x 2 -30"		D
1	car	2-½ x 2-½-60"		D
3	cars	1 x 1 48"		D
2	cars	2 x 2 -19"		D
1	car	2-½ x 2-½-19"		D
1	car	2 x 2 & 2-½ x 2-½-60"		D
1	car	2 x 2 & 2-½ x 2-½-18"		D

RED GUM

1	car	2-½ x 2-½-30"		D

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office Dimension Mill & Yard
Belt Line at McLean.
MEMPHIS - TENN.

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated General Office, NEW ORLEANS, U.S.A

AMERICAN BLACK WALNUT

LUMBER **VENEERS**

OUR SPECIALTY

We are prepared to furnish straight or mixed cars, all grades 3/8" to 4" in thickness.

BAND MILL IN DAILY OPERATION

Various items in Quartered White and Red Oak and Cherry.

1/28". SLICED. WALNUT VENEER especially selected for quality wood and color.

The Kosse, Shoe and Schleyer Co.

Lock Box No. 18 St. Bernard, Cincinnati, Ohio.

Agents in all Furniture Centres.
Offices: Jamestown, N. Y. and Grand Rapids, Mich.
Represented in Chicago, Rockford, Ill., Detroit, Kitchener, Ont., Canada, New York City and San Francisco.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

A few Specials :

130,000 ft. 4/4" No. 1 and No. 2 Common Qtrd. White Oak
65,000 ft. 4/4" No. 1 and No. 2 Common Plain White Oak
100,000 ft. 4/4" No. 1 and No. 2 Common Poplar

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

ATLANTIC LUMBER COMPANY
HARDWOODS
Our Specialty—West Virginia and Pennsylvania Cherry
West Virginia Soft Red and White Oak. 1055 Seneca Street

BLAKESLEE, PERRIN & DARLING
A complete stock of seasoned Hardwoods
Including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

T. SULLIVAN & COMPANY
NORTHERN
Gray Elm and Brown Ash
Niagara Street Corner Arthur

YEAGER LUMBER CO., INC.
Our Specialities
Oak Poplar Ash Maple
932 Elk Street

1" to 4 No. 1" Common and 1s & 2s **HARD MAPLE**
Excellent widths and lengths.
Can kiln dry and surface.
G. Elias & Bro., Inc. Elk Street to the Buffalo River **Buffalo, N. Y.**

STANDARD HARDWOOD LUMBER CO.
Hardwoods
Prompt Shipments—from Buffalo Yards or from Mill direct to you
8,000,000 feet Dry Stock on Hand. 1333 Clinton Street

MILLER, STURM & MILLER
Hardwoods of All Kinds
1142 Seneca Street

HUGH McLEAN LUMBER CO.
HARDWOODS OF ALL KINDS
Our Specialties—Quartered White Oak, Plain and Quartered Gum
940 Elk Street

Taylor & Crate Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 ft. of Hardwoods carried at all times at our big Buffalo yards.
RAIL AND CARGO SHIPMENTS
Established 56 Years 2101 Elmwood Avenue

FRANK T. SULLIVAN
Specialties
Cherry, Walnut and Pacific Coast Woods
Main Office: 600 Ellicott Square. Yard: 2598 Delaware Ave.

Buffalo Hardwood Lumber Co. J. B. Wall, Pres't
M. M. Wall, Treas.
T. H. Wall, V-Pres't.
940 Seneca Street
We specialize in—WHITE ASH, OAK AND MAPLE
We handle a complete stock of Quartered Oak, Poplar, Red Cedar.

BUFFALO *"Buy and Sell Hardwoods in this Market."*
FAMOUS LUMBER CENTER
Unequalled facilities for rapid dispatch, by Rail, Lake or Barge Canal, on all your requirements, large or small.
SUPPLYING THE HARDWOOD NEEDS OF THE NATION

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods
White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES – that you can afford to pay
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

KEEN'S LIMITED Ladies' and Children's Shop Bloor and Yonge Sts. Toronto

Canadian E C & S *Birch*

A fine type of wood for Store Fixtures

Store fixtures are primarily for selling goods. Consequently too much emphasis cannot be placed upon their appearance.

Kent-McClain Limited, a Toronto firm of store fixture manufacturers with a reputation that extends across the Dominion believe in this theory and practice what they preach. In the photograph above, the store fixtures are made of Canadian Birch supplied by Edward Clark and Sons, Limited.

Canadian Birch, the premier hardwood is as beautiful in appearance as many of the costliest imported hardwods. Its texture is close and even. It lends itself admirably to the skill and artistry of the craftsman. And from the standpoint of the purchaser there is the real economy which the use of Birch always effects.

For your own benefit and that of your customers use more Birch. Any information you require will be gladly furnished by us. Let us quote you on a trial carload.

Edward Clark & Sons Limited

807 Bank of Hamilton Building **Toronto, Canada**

EFFICIENCY *COURTESY* *SERVICE*

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

WOOD
TURNINGS

Let us quote you on
your requirements
for handles and small
wood turnings

J.H. Connor & Son
Limited
Ottawa Ont.

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co. Limited
ORILLIA ONTARIO

Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

Ash Poplar Cypress

HAFNER

MANUFACTURING COMPANY

We can Ship promptly from St. Louis practically all items of Oak, Poplar, Gum, Cypress.

ST. LOUIS, MO., U.S.A.

ESTABLISHED 1871

Oak Red Gum

If--

it is Canadian Hardwoods we have it.

Still some 1921 stock available.

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVENUE - - - TORONTO

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft.....8/4 No. 1 Com

Band-mills at Baton Rouge, La. Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

Mills: Coal Grove, Ohio

CANADIAN ENQUIRIES SOLICITED

General Offices: 33 Rector St. New York City

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.	—40,000
1¼ in.	— 2,500

CHERRY

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	28,500	5,200	162,900	200,060
1¼ in.	12,500	200	51,600	10,560
1½ in.	22,200	.....	39,700	66,300
2 in.	23,000	.....	33,200	68,900
2½ in.	5,500	.....	4,300	2,200
3 in.	22,700	.....	6,500	5,300
4 in.	4,900	.....	900	400

CHESTNUT

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,500	.....	54,000	34,000
1 in.	63,000	3,500	63,000	15,000
1¼ in.	16,800	100	17,200	33,200
1½ in.	4,500	1,600	47,000	.....
2 in.	14,200	.....	27,300	12,200
2½ in.	4,000	.....	1,000	700
3 in.	.....	.....	300	500
4 in.	1,500	.....	300	.....

PLAIN RED OAK

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
⅝ in.	.....	74,000	42,600	2,000
¾ in.	137,000	266,000	39,800	11,500
1 in.	70,200	7,000	9,400	106,000
1¼ in.	15,700	12,600	300	1,100
1½ in.	49,900	22,200	700	.....
2 in.	60,500	160,000	47,000	5,000
2¼ in.	1,500	1,400	.....	.....
2½ in.	94,100	33,000	.....	.....
3 in.	6,800	20,500	7,000	12,000
4 in.	2,600	4,900	.....	.....

PLAIN WHITE OAK

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
⅝ in.	.....	3,000	16,900	3,000
¾ in.	214,800	200,000	80,000	38,000
1 in.	54,300	82,000	18,200	183,000
1¼ in.	6,700	.....	.....	.....
1½ in.	47,300	39,000	.....	.....
2 in.	27,000	72,000	7,000	7,500
2½ in.	123,800	47,500	2,000	1,800
3 in.	25,800	42,800	2,400	600
3½ in.	4,500	5,000	.....	.....
4 in.	27,000	20,500	.....	.....

QUARTERED RED OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,700	.....	9,700	500
1 in.	4,200	5,400	5,500	1,400
1¼ in.	5,900	.....	1,200	.....
1½ in.	.....	.....	400	.....
2 in.	.....	.....	8,400	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
½ in.	6,100	.....	.....	.....
¾ in.	3,900	.....	8,600	5,000
⅝ in.	2,800	.....	6,500	800
1 in.	29,300	300	5,400	200
1¼ in.	4,000	300	11,000	500
1½ in.	9,000	.....	7,500	.....
2 in.	6,000	.....	22,100	6,700
2½ in.	2,000	.....	400	.....
3 ni.	.....	.....	700	.....
4 in.	2,500	.....	1,700	.....

POPLAR

	Stained Saps	No. 1 Com.	No. 2 Com.	No. 3 Com.
¾ in.	.....	9,000	.....	.....
⅝ in.	39,000	30,300	1,800	.....
1 in.	15,000	67,900	8,800	.....
1¼ in.	13,000	28,700	5,000	.....
1½ in.	2,700	12,000	22,500	8,000
2 in.	15,422	4,400	7,500	.....
2½ in.	3,700	15,800	600	.....
3 in.	3,400	2,900	31,000	9,000
4 in.	1,900	4,300	450	.....

SAP GUM

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
1 in.	.....	400	.....	.....
1¼ in.	.....	200	2,000	9,000
1½ in.	2,400	6,000	13,500	2,500
2 in.	5,100	.....	8,400	24,800
3 in.	.....	.....	.....	300

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4 4	.....	2,500	12,000
5 4	.....	14,000	.....
8 4	.....	15,500	6,000
10 4	.....	10,250	15,000
12 4	.....	3,500	4,000

PLAIN RED GUM

	1 & 2	No. 1 Com.	No. 2 Com.
1 in.	.....	38,300	5,900
1¼ in.	.....	28,000	63,325
1½ in.	.....	30,000	61,300
2 in.	.....	4,000	2,000

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4 4	.....	14,000	56,000
5 4	.....	18,400	31,800
6 4	.....	29,900	50,500
8 4	.....	44,300	33,500
10 4	.....	2,000	3,000

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. **Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY**

LELAND G. BANNING
CINCINNATI OHIO

If you want quick service send us your orders for **Oak, Ash Poplar, Chestnut, Mahogany, Walnut Etc.**

We are shipping from here every day and have had no trouble securing cars.

Canadian Representative: A. E. Klippert, 11 Laxton Ave., Toronto

OAK
Plain and Quartered
Uniform Color—Soft Texture

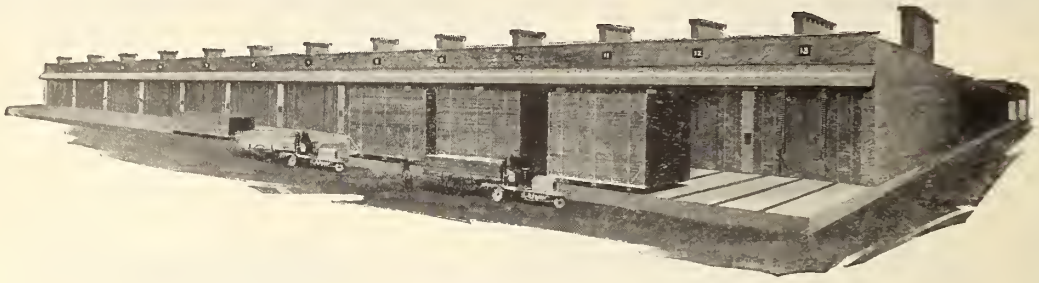
Poplar, Ash and other Hardwoods

Oak Timbers and Planking

THE MOWBRAY & ROBINSON LUMBER CO.
Office: CINCINNATI, OHIO

Canadian Representative:
A. K. Johnson, Bank of Hamilton Bldg, Toronto, Ont.

KILN DRIED HARDWOODS



Kiln capacity 3,000,000 ft. monthly

WEST VIRGINIA
OAK
CHESTNUT
WHITEWOOD
BIRCH
HICKORY

We earnestly solicit your inquiries

AROMATIC RED CEDAR

ARKANSAS
RED GUM
SAP GUM
OAK
ASH
ELM

The M. B. Farrin Lumber Co.

CINCINNATI, OHIO

Dependable Shippers of American Hardwoods

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars

All Canadian and American Hardwoods
Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO

Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.

Subscription, Canada, Great Britain and British Possessions $2.00; United States $2.50; other Foreign Countries $2.00. Single Copies 15 Cents.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 **Toronto, October, 1922** **No. 10**

It Is "Value Plus" That Counts

Andrew Carnegie is said to have once remarked: "It is the work I did in addition to the work I was expected to do that made me successful." The same thought is also expressed by Sheldon in his "Science of Business," where he used the words, "He profits most who serves best." It is the "value or service plus" when given by either employer or employee that counts.

This truth is not realized by the average employee who seems to give more thought to the clock and to putting-in the time than to seeing how much he can produce and thus rendering value plus for what he receives. When you find a workman who realizes the value of giving more than is expected, whose interest is in his work and the success of the organization of which he is a part, rather than in the weekly pay envelope, it will usually be found that his earnings are greater than those of his fellow employees and that he is the one who wins promotion and forges ahead rapidly. It is usually necessary to earn more before increased earnings can be expected and there are few employers who will fail to recognize and reward the man who shows the most in the way of results.

It is a poor rule that will not work both ways so that the employer must render "value plus" to those under him, before he can expect to profit most. There are those manufacturers who strive to give value plus to their customers in the way of value and service, but at the expense of the men who produce the goods. When competition is keen and orders scarce it is value that counts. Under such conditions it is easy to succumb to the temptation to make a slash in prices and then make up for the cut by reducing wages.

In addition to satisfying one's customers, all employers have a distinct duty to perform towards those in their employ. It is those employers who realize this and strive to put it into effect, who have the most to offer customers in the way of value and service. This "value plus" to be rendered the employee may take the form of good wages, satisfactory working conditions, interest in the welfare, improvement and advancement of all employees as well as in their home life and comforts, an incentive for high productiveness in the way of extra earnings, etc. This latter idea when developed along equitable, accurate lines has been found to be unusually effective in securing the good-will and co-operation of all employees, with gratifying and satisfactory results, Workmen cannot be forced to be efficient. It is only by an understanding of the hearts of men and of the natural laws of service that a nation, industry, firm or individual can hope to succeed .

* * *

Elsewhere in this issue will be found an article dealing with several methods of paying for labor, in which mention is made of the value of providing incentives for high productiveness. It might not be out of place to stress one point in this connection and that is the value and necessity of establishing such incentives upon a proper foundation. This is desirable from the viewpoint of both employer and employee. As far as the furniture manufacturing and other branches of the woodworking industry which produce a wide variety of lines are concerned, the ordinary forms of piece work, whether the rates are expressed in time or money, are of little use if the rates are based on past performance or upon the result of time studies that merely give times for certain operations on pieces of given dimensions. This is because of the wide variety of lines manufactured and the rapidity with which the designs are changed. Many of the rates so established would be of little value at the end of, say, six months, owing to the changes in the line which occur in that period, necessitating either further time study to set new rates or guessing at them. Further there is no assurance that rates based on past performance or upon straight time study are correct.

* * *

In other industries it has been found that a vast amount of comparative data, expressed in common terms, so that true comparisons can be made readily, is necessary for the establishment of rates that bear a fair relation to what the operation times should be, that are accurate and that are equitable to all concerned, and the same holds true in woodworking. Further, these rates should be so developed and charted that any production or cost clerk can quickly set accurate rates on new designs and new work without resorting to time study, or estimating or without considering past performance. It is here that basic time standards, as are known in woodworking, differ from ordinary piece work rates or time rates, for in addition to being based on comparative data gathered in different plants, they are so developed and expressed that rates for a wide range of sizes and shapes may be taken from one graph. Thus correct rates on new lines and unusual forms of work are readily ascertainable.

There is plenty of room for both employers and employees in this great woodworking industry to give "value plus." As this attitude becomes widespread those who belong to this class are not only going to get more pleasure from their day's work but they will also profit accordingly.

What Should be the Output of a Special Moulding Department?

A Study of the Operations of Mills Handling Special Orders Shows that, in Spite of Plant Efficiencies, Idle Time Seriously Cuts Down Production—Size of Runs is the Index to Net Yield

The delay occasioned by set-ups or knive changes is the factor that most seriously limits the production of special mouldings. When operators have also to grind their cutters, tail their machines and perform other duties connected with moulder operation, the output is bound to be still further restricted, but even where a special grinding department is maintained, leaving the machine men free to set up and feed, the actual running time is found to be but a comparatively small fraction of the total pay time. Thus an investigation, as detailed below, in the plant of one of the largest producers of special mouldings, shows that, in spite of an unusually efficient work plan, the average idle or lost time amounted to 52.2 per cent of the total pay time. This figure was obtained after a two-months' analysis of the production of ten moulders, so that the result is certainly a fair average of conditions as they pertain to the particular plant in which the study was made.

The problem of the special moulding department, therefore, is to increase the yield as much as possible, in spite of the necessity of incurring waste time through setting up, tailing the machines, grinding the cutters, etc. This may be accomplished to a certain measure by maintaining a separate grinding department and a crew of offbearers, and also by "bunching" items to decrease the number of set-ups and increase the size of runs. Of course, the use of straight-grained material and fast feeds tend to increase production, but if idle time is to be minimized, the size of runs must be made as large as possible.

To indicate what may be expected from moulders operating on special lines, the following record of the operation of a special moulding department will be of interest. The plant in question employs ten moulders and the observations were made over two periods of one month each, the total production for the two months exceeding 1,750,000 feet. The Millwork Cost Bureau was responsible for the study on which the following figures and comment are based.

The data for the two months is shown in the accompanying table. At the end of the first month, machine No. 11 replaced machine No. 2. No changes were made in operators.

The plant which maintains the moulding department under consideration is one of the largest manufacturers of special work. Due to "bunching" of items, its runs, as a whole, probably average more

Mach. No.	Total Hours	Lin. Ft. Run	Set Ups	Minutes Running	Minutes Down	% Loss	Avg. Ft. per SU	Yield per Min.
1	141.3	139,900	99	3,448	5,030	59.3	1,413.1	16.5
2	202.9	146,516	178	4,740	7,434	61.1	823.1	12.0
3	185.2	132,224	126	4,830	6,282	56.5	1,049.4	11.9
4	187.0	128,744	115	5,334	5,886	52.5	1,119.5	11.5
5	212.0	102,085	127	5,956	6,764	53.1	803.8	8.0
6	202.0	92,673	139	7,782	4,338	35.8	666.7	7.6
7	193.0	75,417	129	4,938	6,642	57.4	584.6	6.5
8	125.0	47,746	87	2,550	4,950	66.0	548.8	6.4
9	206.0	67,463	127	4,329	8,031	65.0	531.2	5.5
10	212.1	53,467	129	5,880	6,846	53.8	414.5	4.2
	1,866.5	986,235	1,256	49,787	62,203	55.5	785.2	8.8
Second Month								
1	129.0	128,300	79	3,242	4,498	58.1	1,624.1	16.6
3	192.0	152,675	126	5,280	6,240	54.2	1,211.7	13.3
6	192.0	94,934	122	6,918	4,602	39.9	778.1	8.2
9	192.0	87,324	120	5,532	5,988	52.0	727.7	7.6
5	188.7	86,379	106	4,942	6,380	56.4	814.9	7.6
4	177.0	73,691	103	4,848	5,772	54.4	715.4	6.9
8	182.0	49,346	119	4,532	6,388	58.5	414.7	4.5
7	159.7	42,432	91	5,904	3,678	38.4	466.3	4.4
10	172.0	42,586	110	6,424	3,896	37.8	387.1	4.1
11	141.0	24,093	40	5,530	2,930	34.6	602.3	2.8
	1,725.4	781,760	1,016	53,152	50,372	48.7	769.4	7.6

Summary—Two Months

Total time, 3,591.9 hours or	215,514	minutes
Total production	1,767,995	lin. ft.
Total set ups	2,272	
Running time	102,939	minutes
Idle time—includes setting up but no knife grinding	112,575	minutes
Loss	52.2	per cent
Average run per set up	778.1	lin. ft.
Average yield per minute of total time	8.2	lin. ft.

lineal feet to the set up than is common in most special mills. Moulding orders, as far as practicable, are allowed to accumulate so that the various items of one size and design may be run on the same set up. This firm also maintains a grinding department and a crew of offbearers; hence the moulder operators need not concern themselves with cutter grinding or tailing their machines. Set ups or knife changes, however, are performed by the operators.

Over 52 Per Cent Waste Time

In spite of this efficient work plan, the average idle or lost time occasioned through set ups, whetting up, oiling, and unavoidable delays amounted to 52.2 per cent of the total pay time. Converted to minutes of loss per single run, amounts to 49½ minutes. Where operators do their own knife grinding and tailing, and bunching of like items is not resorted to —other conditions being equal—the lost time will be higher and the yield per minute lower.

If the production of the entire department for the two months were based on only the **actual running time,** instead of total pay time, the yield would be 17.1 lineal feet per minute. That figure represents maximum or 100 per cent production and would be attained only if the whole quantity, 1,767,995 lineal feet, were put through the department in one run. One must conclude, therefore, that the millman who, even though he has not conducted tests of this sort, is nevertheless endowed with sufficient faith to proclaim to the world that his stickers produce 35 or 40, or even more feet of special moulding per minute of pay time—not running time—is laboring under a serious delusion.

The individual machine performances listed in this record reveal some significant facts; viz., the highest speed attained by any machine, considering **running time only,** was 39.6 lineal feet per minute—machine No. 1, second month. Machines Nos. 1, 3, 6 and 9, by reason of longer runs during the second month, show increased net yields. Machines Nos. 4, 7, 8 and 10, because of shorter runs during the second month all show decreased yields. It is interesting to note that machine No. 2, in the first month, while incurring through many set ups for runs little higher than the average, a high percentage of idle time, nevertheless, ranked second in production for the month. The conclusion must be that the production consisted of straight-grained woods which permitted using faster feeds. Just the reverse is true of machine No. 11—its output evidently was composed of "impossible" or cross-grained material. Machine No. 5, while not maintaining its production during the second month, did have longer runs, but apparently they were of more difficult lumber.

Straight-grained material and fast feeds make for high production, but the real index to net yield is "size of runs."

Production in Other Plants—Factory No. 2

Other investigations of a like nature have been carried out by the Millwork Cost Bureau, the data being tabulated below:

During a week's operation, involving 50 work hours per machine, 2 moulders employed in the production of special mouldings show results as follows:

	15" Moulder	10" Moulder
Total time, minutes.	3,000	3,000
Total run, lin. ft.	32,622	12,866
Total set ups.	112	65
D4S set ups.	40	6
Set ups of 100 lin. ft. or less	74	36
Set ups of 500 lin. ft. or more	14	6
Shortest run per set up, lin. ft.	8	15
Longest run per set up, lin. ft.	6,500	2,600
Average run per set up, lin. ft.	291.3	198.2
Average production per minute, lin. ft.	10.9	4.3

Converting the above to an average of both moulders will give:

	Both Moulders
Total time, minutes.	6,000
Total run, lin. ft.	45,508
Total set ups	177
D4S set ups	46
Set ups of 100 lin. ft. or less.	110
Set ups of 500 lin. ft. or more.	20
Shortest run per set up, lin. ft.	8
Longest run per set up, lin. ft.	6,500
Average run per set up, lin. ft.	257.1
Average production per minute, lin. ft.	7.6

The record of the 15" Moulder shows an unusually high number of set ups for the week. This is probably attributable to the fact that 40 of the 112 knife changes were for "Dressed 4 sides" material.

The rates for the average production per minute are based on the total number of working hours, including set ups, delays and all idle time.

Factory No. 3

During a week's operation, involving 54 work hours per machine, 2 moulders employed in the production of special mouldings show results as follows:

	No. 1 (10")	No. 2 (10")	Both
Total time, minutes.	3,240	3,240	6,480
Total run, lin. ft.	18,460	27,263	45,723
Total set ups.	83	48	131
Shortest run, lin. ft.	9	5	5
Longest run, lin. ft.	1,098	3,700	3,700
Average run, lin. ft.	222.4	568.0	349.0
Yield per minute, lin. ft.	5.7	8.4	7.1

Factory No. 4

During a period of 6 weeks, 2 moulders employed in the production of special mouldings show results as given below. No record was kept of the number of machine set ups, but there were no long runs. Most of the very short runs were made on machine No. 2.

	No. 1 (12")	No. 2 (8")	Both
Total time, hours	207.8	319.0	526.8
Total time, minutes.	12,468	19,140	31,608
Total run, lin. ft.	127,244	97,036	224,280
Yield per minute, lin. ft.	10.2	5.1	7.1

In both the above instances, the yields are based on the total number of working hours, including set ups, delays, and all idle time.

New Edition of Thomas' Register

The thirteenth annual edition of Thomas' Register of American Manufacturers has just been published. The new volume is 4,500 pages in size, is cloth bound, and while listing only the products and raw materials from United States sources of supply, is used by nearly 700 purchasing agents and buyers for Canadian concerns. The book is divided into three main sections. Over 300,000 makers of 70,000 articles or products are listed in the first section, there being, for example, 2,0166 kinds of machinery classified, with the names of the makers of each kind given. There are 99 kinds of acid classified, 285 kinds of brushes, 85 kinds of leather, 110 kinds of pins, 63 kinds of soap, 242 kinds of valves, 65 kinds of wax, etc. In another section all the manufacturers are listed alphabetically, with addresses of head and

branch offices, officers of the company, etc. An exclusive feature is the capital rating showing the size of each concern, giving the reader some knowledge as to whether the firm is a hundred million corporation or a small forty thousand factory with limited capacity. A third section lists 50,000 branded articles with the names and addresses of the makers of these trade named products. There is also a list of exporters and importers, with a directory of banks, commercial organizations and trade publications. The Thomas Publishing Company, New York, represented in Canada by the Canadian Buyers' Register Company, 91 Constance St., Toronto. The price of the book is $17.50 delivered in Canada.

How do You Pay for Your Labor?

Do You Make Use of an Incentive Plan of Wage Payment Based on a Definitely Established Standard of Production?—The Earned Time Plan, Through its Fairness and Basic Soundness, Creates Employee Confidence

By L. R. Wright*

A writer in a recent issue of a well-known trade journal stated that through the use of an incentive plan of wage payment, it is usually possible to secure worth-while increases in production, such increases varying anywhere from forty to ninety per cent. Whether or not his estimate of the resultant improvement is correct, it is generally conceded that paying for what is produced results in greater production and what is more, if the rates of payment are established upon a fair, accurate basis, the workmen, as a rule, prefer to work under some form of an incentive plan.

The trouble in the past, and even today, is that when an attempt is made to establish a rate by which to pay for what is produced, an accurate, definite basis upon which to establish such rates is lacking, with the result that the rate is more or less guessed at or estimated. If under these conditions, the workmen earn more than it is thought they should, the rate is cut. This process is often continued, with the result that the workmen decide that they are not going to be permitted to earn much more than the regular day wage, and relax their efforts. This is unfortunate, for not only has the confidence of the employees been lost but the highest degree of productiveness possible under this method of payment has not been attained.

An Accurate Standard Must be Established

The trouble was that a definite basis for fixing such rates is lacking. Establishing rates upon a basis of past performance or upon straight time study work in one plant is not satisfactory, because when that is done, the basis upon which the rates are fixed is invariably not correct. The average time in which a certain operation has been performed is, for example, ten minutes, whereas the actual time in which that operation should have been performed is seven minutes. Any rates fixed on the basis of the past performance time of ten minutes are bound to be too high. This holds true ninety-nine times out of a hundred, for it is seldom that an operation is performed as it should be.

In establishing the price to be paid for certain work either in money or time, the workmen have a pretty good idea as to whether or not they were guessed at or as to whether or not they are fair. This point must be considered. For this reason, it does not do to adopt the attitude that because this operation requires ten minutes under present conditions a rate based on five minutes would be about proper. For general, all around satisfaction, the operators must know, must be shown, if necessary, that the basis upon which the rates are fixed is both definite and accurate. You should be able to say, for example, "here is a rate based on standards established by studies made in a number of plants. This work can be turned out in seven minutes but we are willing to pay at the rate of eight minutes for all you produce." In other words, on a definitely established standard of production, it is possible for the average operator to earn a bonus of fifteen per cent over and above his regular wage.

The idea of payment in time has been for the past number of years, considered much better than rates expressed in dollars and cents. Under the ordinary piece work plan, the men were paid so much money per unit of production. This is not at all flexible, inasmuch as the amount of money paid must be raised or lowered to confirm to the general level of wages. This means that the rates must be changed frequently. Again such a method does not permit graduating the rates so that an employee who had been with the organization for a number of years could be rewarded for length of service, dependability and punctuality, as a new employee would expect the same rate per piece as the rest receive. When a rate of so much time per unit of production has been established, a permanent basis for paying for performance has been established. If a certain operation can be performed in ten minutes today, then regardless of any changes in wage levels, it should not take any longer the next year or the year after. True the ten minutes may be paid for at the rate of fifty cents an hour one year and forty cents the next, but the time rate would not change. Further, if the men on a certain class of work are receiving fifty cents an hour, a new employee can be paid at the rate of forty five cents an hour, based on the same time rates, until he makes good, when his pay can be increased to the same as the rest are receiving. This gives him an added incentive to stay and make good.

Success of the Earned Time Plan

This time rate plan of wage payment, or earned time plan, is being worked very successfully in different woodworking and furniture plants. The time rates are best estimated upon basic time standards, allowing a definite incentive for high productiveness. These standards indicate operation times as they should be, without any reference to what they are, and thus provide a definite, accurate basis upon which to intelligently fix rates. Using basic time standards in this way, the operation time is brought down to as near the standard as conditions permit before the time rates, including the incentive, are established.

*Statistician, Forest Products Engineering Co., Chicago.

(Continued on page 64)

The Productive Power of Good Lighting

Plant Managers Should Recognize the Importance of Daylight in Their Factories —Output Is Increased, Greater Accuracy and Better Workmanship Are Obtained and Labor Turnover is Lessened

By Russell J. Waldo

Business leaders are fast coming to realize that light plays an important part in controlling the production of their plants. Ever since man has used shelter for the making of any product, he has been accustomed to carry his work from a dark spot to the window where he might work with greater rapidity and more accuracy. It has within the last few years been proved that to have the maximum production, the room must be lighted sufficient to permit

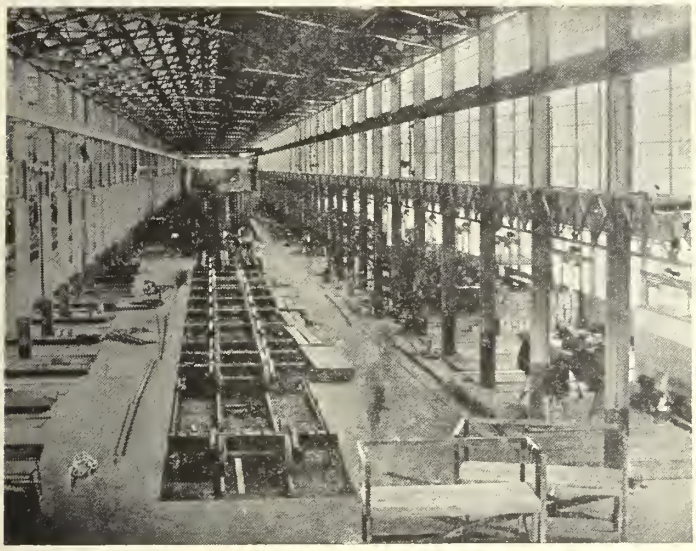


Fig. 1 An even distribution of light is obtained from window walls

the worker to work at his best and with little detraction or extra work in search of light.

There are various methods of lighting the plant during the day—window walls, saw tooth roofs, white paint, and in extreme cases artificial lighting. While every plant has need for proper artificial lighting, it is the purpose of this article to deal only with natural light requirements, leaving artificial lighting to be discussed in a separate article.

It is only through satisfactory illumination, and that preferably by daylight, that employers can obtain maximum efficiency from their workers for it is light that controls to a very large extent an employee's output, contentedness, safety and workmanship. Furthermore, properly lighted plants have greater and better production because of the ease which is possible in checking up the work by both workers and inspectors.

In considering the question of proper light, it must be recognized that glare is as bad as insufficient light. This is overcome by shades or by whitewashing the glass, preferably by the first method, because the shades can be lifted in case of darkening clouds.

Some of the Advantages of Good Lighting

One of the most important considerations in connection with the proper lighting of plants is the safety element. If the proper lighting is provided to protect the worker and allow him to see thoroughly before he acts, he is then in a position to produce more. Dark corners, passageways and poorly-lighted rooms contribute to bodily injuries. An employee may fall in a dark spot or he may become injured because the work-room is dark. Therefore, the proper amount of light by protecting the worker from injury, will contribute very materially to his efficiency.

Sufficient light permits the greatest accuracy in the employee's workmanship. No workman can do his work well when he must strain his eyes, which he must do if lighting is poor. Proper lighting will allow him to exercise care and accuracy in his work with the result that the workmanship will be of the best. In this manner the scrap pile will be decreased and there is less waste because poor lighting will cause the workman to misjudge or miscalculate his measurements, which means scrap every time. Because he can readily see what he is doing his productive ability is increased to its maximum. He is not required to spend time in determining whether he is right or not. Therefore, it is possible to work with greater rapidity.

Proper lighting is one of the most potent factors in improving working conditions. No employee likes to work in a poorly lighted plant for it deadens his

Fig. 2 Good workmanship is a natural result of good lighting

ability and has a tendency to make him melancholy. It is a well-known fact that the man who works in the well-lighted building feels better and puts more snap into his work. He can work with greater accuracy and is not under that strain which comes when a man feels that he might be wrong on account of the poor light.

Cleanliness in the Plant

Proper lighting tends to increase order and neatness in the workroom. Because things are visible dirt does not accumulate and scraps, such as boxes and

papers, are not thrown about as they are in a dark room. Men are able to keep their machines and work benches cleaner and to take a greater personal interest in their work-place. Cleanliness and neatness of this kind help to make the workmen feel more contented and more comfortable than they do in a place littered up with papers and boxes. Incidentally, this has been found to decrease labor turnover very materially.

Another result of proper lighting is the fact that there is better supervision of the men. In a well-lighted room the men may be more easily controlled, while the darkened room encourages soldiering, and often a nap during the work hours. In the well-lighted plants the foreman is able to see in all parts of the room which would be an impossibility in a poorly lighted plant.

It is of vital importance that natural light should be obtained from every available source during the daylight hours. This is not only important from a human standpoint but from the productive standpoint, and with the methods in use to-day for distributing light to the plants it is easily and cheaply obtained.

The three major considerations in proper daylighting are sufficient lighting area, continuous lighting, and proper distribution of the light. The first is obtained by using the greatest amount of window space. Continuous lighting is obtained by installing sufficient windows so that the greatest amount of light may be had even on the dark days. Proper distribution is obtained by properly distributed windows and in addition light walls to reflect the light down upon the work.

Figure 1 shows a plant interior with window walls. This is a striking example of what light can

Fig. 3 An installation of shades to control the light intensity

be obtained from window walls. The light is even and from the entire side of the building.

In Figure 2 we find the workers before the windows with sufficient light. Many plants have the work benches before the windows and the machines setting back. This is a good idea providing the entire wall is taken up with windows as is the case in the plant illustrated.

In plants having window walls the shade plays an important part. On sides exposed to the sun these shades are used as shown in Figure 3. This is a typical shaded room and proves very satisfactory in cases of close work.

The saw tooth roof deserves careful consideration both from the light and ventilating standpoint. In Figure 4 is shown the saw tooth roof of one large

Fig. 4 The saw tooth roof which contributes to even light and good ventilation

p'ant. When these sash face the north a very even light enters and makes the workroom uniformly light.

Plant managers are fast turning to their plant lighting in an effort to settle their production problems and rightly they should, for in the best lighted plants today are found the best work and the most efficient workmen.

Properties of a Good Preservative

A list of the various substances that have been used or suggested for preserving timber from decay would include a surprisingly large proportion of those known to industrial chemistry. By-products for which no use could be found have often taken their last stand as possible preservatives of wood. There have been sent to the U. S. Forest Products Laboratory for testing of their preservative qualities the condensed fumes of smelters, the waste liquors of pulp plants, the refuse of tanneries, the skimmed milk of creameries, and a wide assortment of compounds under trade names.

Very few materials have been found to have value as wood preservatives. Most of them lack one or more of the following requirements.

To preserve wood against decay a substance must first of all be poisonous to wood-destroying fungi. Decay in wood is not due to direct chemical action or action of the elements but is always the result of the activity of these plants which feed on the wood and thus destroy it. To prevent fungus infection, the preservative must be able to penetrate the wood thoroughly enough to form a continuous exterior shell of poisonous treated wood deeper than any surface checks which are likely to develop, and to retain its toxicity, or poisoning power, under service conditions.

Safety in handling and use is another important consideration. A wood preservative must not be a dangerous poison to men and animals, a highly inflammable substance, nor a material injurious to wood. If it seriously corrodes iron, steel, or brass

its use is limited because of its action on the treating equipment and on bolts and metal fastenings in contact with the wood in service. Color, odor, and effect on paint are sometimes of considerable importance.

Provided a preservative meets these requirements its cost, availability, and uniformity will largely determine its usefulness.

There are materials of established protective value now on the market which are both cheap and plentiful. The standard wood preservatives in the United States art zinc chloride and coal-tar creosote. Their value has been established by many years' use of millions of railroad ties, poles, posts, paving blocks, mine timbers, and other wood treated with them. Search for new and better preservatives is constantly being made, but in the meantime the wood preserving industry has at its command these reliable materials.

Are Your Men "Sold" on Safety?

The Workers Must First Be Thoroughly Imbued with the Importance of Safety Measures before Results Will Be Forthcoming

By J. M. Hatch*

To get the best results from safety measures requires first of all salesmanship, and the best results will be obtained only by salesmen who can get the viewpoint of the workers. Workers do not take kindly to one who does not know as much about their machines as they do themselves. So, in order to get the workers interested, let them make the suggestions as to how to guard the machines by just leading them up to the point. Guards made from their own suggestions will be the ones you will get results from. Do not make the men use your guards before allowing them to make suggestions, for what you have may work all right on some jobs and hinder production on others. The men should be the ones from whom to get the real facts.

It is just as important to use different methods with men, as to use different guards on the different machines, so one that is a good judge of human nature will get the best results—will prove the best safety salesman.

A guard should not be used as an ornament. Unless it is practical you had best throw it away, for if the men think it is there just to give a shop a well guarded appearance rather than to get real results—the interest and value are lost.

At the American Seating Company we have employee representation and are thus able to give the men a voice in the matter of safety. We have a safety committee from the House of Representatives and one from the Senate that go through the factory each month and investigate and get suggestions from the men. Then only do the committees take action by submitting reports at the next meetings of their bodies. Tags with numbers are left on the parts of machines found dangerous by the committees and are not removed until they are corrected by the safety engineer who turns in the tag. By this method the committees can keep up with conditions in all departments.

*Foreman, the American Seating Co., Grand Rapids, Mich., before the Woodworking Section of the eleventh annual National Safety Congress, Detroit, Mich.

But to return to the specific question of salesmanship, selling safety to operators of woodworking machines. To accomplish this various methods may be employed but we have found the first aid, contests between departments and the employees' magazine as the biggest contributing factors.

Take the first aid, which was established in 1921, and let's make some comparisons. In 1920 the total number of days lost due to accident was 1,346. In 1921, with the first aid in operation, this figure was reduced to 377. I might be able with a little figuring to tell you what this has meant in dollars and cents to the company and in dollars and cents to the workers, but suffice it to say that the compensation paid out in 1920 was $6,914.41, while in 1921 it was but $1,317.28, a saving of $5,597.13 here.

Again, that bugbear—infection—was made the subject of a vigorous campaign to have minor injuries treated in the first aid and our records show that the lost time due to infection was reduced from 349 days in 1920 to 13 days in 1921.

In one department in our plant the accidents were reduced from an average of 52 a month to none at all for the twelve consecutive months ending March 31 last.

Needless to say, safety devices alone did not accomplish all this. It required the co-operation of every man in the department and this in turn meant that every man in the department was first "sold" on the value and importance of safety—a feat which could not have been engineered had not the management been more than passively interested in the subject.

H. M. Taliaferro, our manager, was one of the handful of men who early came to a realization that industry had become a slaughter house and set about to make a study of safety on the theory that accidents were not unavoidable. He was one of the organizers of the Safety Council in Grand Rapids, just as he was among the first to see that in industry the human element had been overlooked in the mad rush for mechanical development.

And as Mr. Taliaferro said to us in the beginning: "Strange as it may seem, the hardest thing will be to get the man on the job to see the point." He insisted a man's dependents had a right to expect to see him return whole to them after his day's work and that we must "sell" him first of all on the importance of self-protection.

So the industrial relations department started its wheels in motion, always keeping this objective in mind and in the case of the department cited the same committees, co-operating with the men and the safety engineer, adopted safety devices, many of them invented by the men, while a contest between departments was started on the basis of time lost monthly.

But this was not all. The first aid was at work, in which the full-time nurse played an important part in obtaining the co-operation of the men while "The Seater," our plant paper, was getting the message across through news stories, illustrations and editorials, and at the same time building up goodwill in the organization, which makes that valuable asset—the goodwill of the customer—possible.

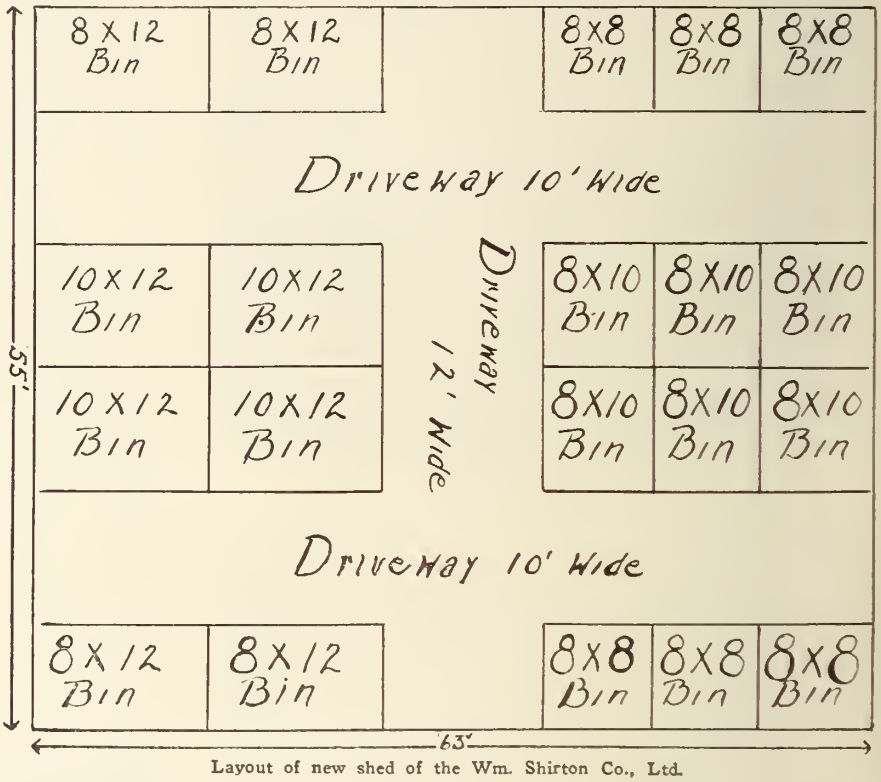
And before closing, here's another big little point: See that the foreman is thoroughly sold on safety before spending money and effort on a safety campaign. He is the one closest to the men.

New Storage Shed for End Piling Lumber

Progressive Ontario Woodworking Plant Completes Shed Where Space is Saved by End Piling—Care Must be Exercised in Piling the Narrow Stock to Obtain Substantial Piles

The William Shirton Co. Limited, of Dunnville, Ont., which is one of the most progressive retail lumber and woodworking plants in Southwestern Ontario, has just completed a spacious new lumber storage shed. The structure embodies the latest features and provides for the end piling of all lumber. K. J. Shirton, who is head of the company and also vice-president of the Ontario Retail Dealers' Association, says he will be pleased to have visits from any retailers who may be interested in building a structure of similar design.

The accompanying view affords an idea of the exterior appearance of the shed while the floor plan shows the size and location of the bins and driveways. The foundation of the building, which in dimensions is 55 feet wide, 63 feet long and 18 feet to eaves, is of concrete 10 inches in width and extends 12 inches above ground level. The floor also is concrete 4 inches in thickness. The walls are sheeted and covered with corrugated iron. The frame was constructed in bents on the ground and then raised in a manner similar to the method pursued in building a timbered barn.



Layout of new shed of the Wm. Shirton Co., Ltd.

The roof storage shed is covered with asbestos roofing on top of cedar sheathing. In the centre three rows of cement piers support the posts of the building and the bins are divided by 2 x 6 inch studs covered with sheeting on one side.

Mr. Shirton says the building was constructed for the end piling of lumber. This method results in saving a great deal of space but care must be exercised in piling, particularly with narrow width material. It is necessary to give strips, flooring and other narrow stock more of a slant or incline than wider lumber, otherwise the piles will have a tendency to topple sideways.

The shed will hold from 125,000 to 150,000 feet of material. Rough lumber for milling is piled on one side of the structure nearest to their factory, and dressed material on the other. Mr. Shirton states they have already found the building to be a great convenience enabling them to carry a large stock of lumber ready for customers and also assisting to keep a close check on all quantities of dressed material.

The approximate cost of the new storage shed was $3,000. Mr. Shirton says they were able to save a little by using a certain amout of unsaleable material such as their short hardwood sheeting and culls from 2-inch hemlock. In using this stock more work was required; therefore, the cost was not reduced to any considerable amount, but it is always some advantage, he declares, to clean up a yard occasionally of cull material which is bound to accumulate.

New dressed lumber shed of the Wm. Shirton Co., Dunnville, Ontario

The business of the William Shir-

ton Co. was established in 1895 and conducted by Mr. Shirton, the founder, until 1909 in which year he passed away. A partnership was then formed of the family and carried on as such until 1915 when a change was made to a joint stock organization under the present name.

The company use hydro-electric power but at one time employed chiefly natural gas. This, however, is becoming exhausted in that district, but Mr. Shirton says it would be more economical than either electricty or steam providing its continuity and abundance were assured.

For many years, the company have manufactured cross-arms which developed into quite a prominent side line. In the making of cross-arms B. C. fir is employed as this wood is, the firm declare, the most desirable from every point of view. The dimensions generally in use are 3 x 4 finished and 3¼ x 4¼ finished, while the lengths vary from 4 to 10 feet. Mr. Shirton added that, if manufacturing cross-arms exclusively, they could supply the demand for the whole of the Dominion. Many Western mills are now making cross-arms which are also turned out by other firms in Quebec and in Ontario. The demand in Canada is thus pretty well taken care of. So far as an export trade for them is concerned, the excessive cost of transportation prohibits any large business being developed.

On Circulation Depends Kiln Drying Success

Inverted V or Chimney in the Centre of the Pile Helps in Some Degree but Other Provision Must be Made for Directing and Controlling the Flow of Air to Avoid the Production of Dead Air Pockets

By M. O. Reid*

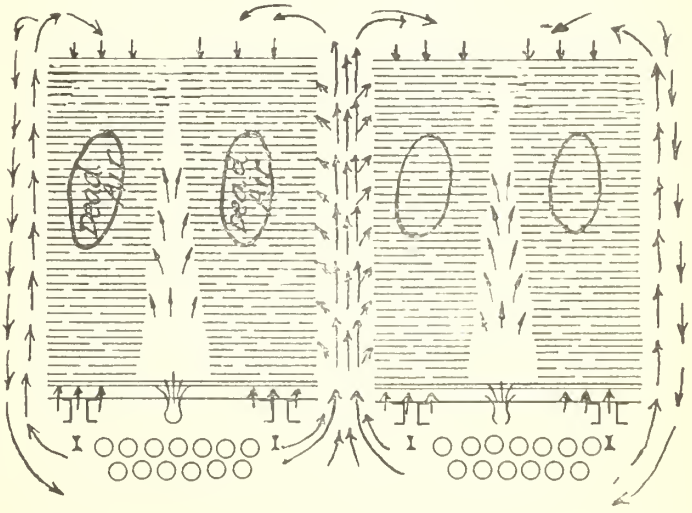
The article in the September "Canadian Woodworker and Furniture Manufacturer" by A. M. Smith entitled "Dry Kiln Capacity Increased by an Improved System of Piling" touches on a phase of dry kiln operation that is extremely important, that of securing a circulation of warm, conditioned air through the lumber piles. The necessity for even, adequate circulation has been treated so often that there should not be any need for emphasizing this phase of kiln drying, but there is plenty of room for a discussion as to how a good circulation may be secured.

In the average kiln, the circulation is what is termed "natural circulation." This term is used in contradistinction to circulation accelerated and maintained by mechanical means, such as condensers, water or steam sprays and suction or blower fans. In one, advantage is taken of the natural movement of heated air while in the other the warm air is literally forced through the kiln with a positiveness and speed not usually encountered except where mechanical circulation is used.

The natural movement of warm air is upward. As this air cools, it gradually drops so that in a room or kiln having a heating coil near the floor, there is a natural circulation of air up from the coil and down around the cooler walls and then up through the coil again. It is on this principle that most dry kilns are based. Provision is made for placing the heating coils near the bottom of the kiln and the lumber to [illegible] is placed above the heaters in the direct path of the upwad currents of warm air. The assumption was that the air worked up through the lumber, out of the top of the piles and down the sides again or in some out through ventilation placed along the ceiling or walls.

In developing this idea two important facts were overlooked. First, that while the movement of warm air is upward, there is also a strong tendency for the air to follow the line of least resistance, which means that in this case the warm air would rise around the lumber piles rather than work its way through them. The other point that was overlooked was as warm air picks up moisture, it gives up some of its heat in exchange for that moisture, becoming cooler and heavier and exhibiting a strong tendency to fall or descend. For this reason, the circulation through a pile of damp lumber is downward rather than upward.

Building the piles of lumber with an inverted V or chimney in the centre as suggested in Mr. Smith's article, helps some, as it tends to carry some of the warm air into the heart of the piles. This actually divides the dead air space, which so often exists in the centre of a pile, but unless other provisions are made for directing and controlling the flow of air, dead air pockets will develop in either leg of the V. For this reason lumber piled this way should dry a



little more quickly than in the more solid piles but merely making a chimney in the pile has very little effect on the circulation. Perhaps this is best illustrated by the accompanying sketch. The arrows indicate how the air would move and the dead air pockets which would form are also shown.

Depending upon the natural movement of warm air only, or even when aided by ventilators and air ducts, it is extremely difficult to secure an adequate circulation through the centre of the piles of lumber unless the air movement is controlled and directed along certain definite channels, preferable along the

*Associate Engineer, Forest Products Engineering Co., Chicago.

lines the air currents would follow if not checked or obstructed. They would naturally move upward from the heating coils outside the piles, downward through the piles and thence on down to the exhaust ducts and heating coils. Where the air movement is sluggish or uncertain the drying is slow and the conditions are more or less beyond control. Before the rate of drying in the sluggish spots can be increased and brought into conformity with the rate at which the rest of the pile is drying, the circulation must be made uniform throughout the pile. When this is accomplished, the drying period may be materially shortened and the cost of drying reduced for it is no longer necessary to hold the stock in the kiln while waiting for the slower sections to be brought down to the desired moisture content. Thus, without making any changes in operation methods, or in the temperature and humidities carried, a considerable reduction in the drying time can often be effected simply by improving the circulation in the kilns.

Working along these lines, it is often possible to effect a marked improvement in the working of a kiln through simple and inexpensive improvements in design and equipment tending to facilitate the circulation through the tiers of lumber, by directing the warm air through the piles and providing definite channels of travel.

What is Involved in Burden or Overhead?

Its Meaning is Not Always Clearly Understood and Consequently Serious Errors Develop in Cost Estimates—The Factors Involved in Burden and How they are Distributed in a Woodworking Plant

By U. E. Germain*

On considering the different articles published in recent issues of the "Canadian Woodworker" on the cost of production in woodworking factories, it occurs to me that while the direct cost of production is very well understood the overhead or burden is not clear to some manufacturers, and is wrongly applied in their cost estimates. This is misleading and more harmful than having no cost record at all, as it leads to erroneous figures which only spell disaster.

The matter of computing and distributing the burden or overload, which constitutes quite a large percentage of the total cost of the finished product, depending on the conditions under which it is manufactured, is one of the most puzzling problems involved in costs. At the outset it must be understood that burden has to do with the productive cost of the goods, and not with the marketing of the goods. Selling or marketing costs do not enter into burden of production at all. Factory costs, which is what we wish to discuss, is the value of the product when it is turned into the warehouse—the selling expense must not be included in the factory cost figures until the products are in the warehouse or ready to market, as otherwise it would inflate the actual value of the goods.

In burden is included every expense necessary to the manufacture of an article outside of the direct labor cost and cost of raw material. The different elements which make up burden are as follows:

1. Administration.
2. Indirect labor,
3. Power. lighting, heating,
4. Insurance, taxes,
5. Depreciation, repairs and maintenance.
6. Interest on borrowed money and general bank charges.

Determination of the Burden Factors

Administration or management of the factory is a burden to the extent to which the time of the manager, his assistants, the office staff, the finance department and other units is involved in the productive end. As an example, if the manager of the factory looks after the selling, and his assistants look after the manufacturing end, at least a fraction of the salary of the manager goes into selling expense. The same principle applies to the finance department, the pay roll department, etc., as will be explained later.

The indirect labor includes all the men and boys about the factory who do not work directly on the produce. The superintendent's salary comes under this classification; likewise that of his assistants and foremen.

The power, lighting and heating burden is determined from the cost of same and distribution prorata to the floor space of the factory, or the horse power used by each department. The latter way is far better as the manufacturing of some lines may need large floor space but little power or vice-versa. The distribution can be ascertained from the horse power of the machines used.

The insurance burden is distributed according to the value of the investment in each department and is treated separately in the cost. The same applies to taxes.

The repairs and maintenance burden is generally kept separate, and it is easy to find the accurate figures for each department. The hard nut to crack is the depreciation of plant item. which is so pliable a matter that no accurate figures can be depended upon. Depreciation applies both to the machinery and the building. We will not enter into this point at length but let us remember that depreciation has to be studied very carefully and the local conditions considered. The depreciation of the plant will depend upon the nature of the building, a wooden frame building absorbing a greater percentage of depreciation than a concrete or brick building. The rate of depreciation on buildings varies from 2 per cent. to 8 per cent. according to the stability of the building and the nature of the work that goes on within. In the case of machinery, the depreciation is considered from two different standpoints of great importance—the efficiency of the machine with regard to its production, and its daily capacity as compared with other recent machines. A machine may be in perfect order and do very good work, but its capacity is limited and not up to that of newer machines, and thus it is not as efficient and its percentage written off should be larger than in the case of another machine which does not cut down the speed of production. Besides, there is also the depreciation

*Of U. E. Germain Lumber Co., Montreal, P.Q.

of wear and tear, figured accordingly to the nature of the work of the machine.

The interest burden can be figured either in the cost of production or with the sales cost. It is established that borrowed money is often required on account of slow collections on the sales, and the cost of same should be figured in the sales cost . This is a matter to be decided by the manufacturer himself.

Distribution of Burden

Now that the different elements which make up burden or overhead have been discussed, let us study how they are distributed over the production of the factory and absorbed in the initial cost of the product. This is the important point in determining the cost of the product when delivered to the warehouse or to the shipping room.

As a sash and door factory is generally only a part of a general lumber business, carrying on a retail trade, a planing mill and hardwood flooring business, besides a general line of building supplies, it is necessary that the total burden or overhead should be distributed first amongst these departments in accordance with their importance and the amount of time and capital involved in each department. To illustrate further we will say that our total burden for one year is $27,982.00 and is distributed as follows: wholesale and jointing department, $8,750.00; retail and building supply department $5,340.00; planing mill moulding and hardwood flooring department $4,300.00; and factory department $9,592.00. We have to do with this amount of $9,592.00 as our general burden for the year, which is divided into twelve equal amounts to apportionate the burden per month, and we find an amount of $799.33 per month. The indirect labor burden is then figured every month, as it changes according to the amount of non-productive help about the plant. Suppose we find this item as follows.

Superintendent	$300.00
Foreman	160.00
Non-prod. labor	430.00
	$890.00

which brings up our total burden for the month to $1,689.33. This is the amount which has to be borne by every operation in the plant and which goes to make the cost of production.

While there are many systems and ways to distribute this amount to each operation, my experience has proved—that the only efficient plan of distribution of burden is by the productive hour method, which means that every minute of a workman's time is carrying a percentage of burden, together with his wages. The percentage is worked from month to month according to the total of productive hours during the previous month, as shown on the pay roll.

We find that we have a total number of productive hours for one month of 4,400. Our total burden is $1,689.33. The amount of burden per hour would then be .384 cents for every productive man in the factory. Thus a benchman earning 48 cents per hour is really costing .864 cents per hour.

This, on the surface, looks very accurate, but still a further consideration of distribution is to be undertaken. As all the men in a factory are not working on the same wages and doing the same kind of work, the rate of overhead per hour cannot be the same for all. For instance, a benchman cannot be assessed as high as an operator of a high priced machine, for the reason that the benchman only uses heat and light, while the machine is using power, light and heat, besides which the machine he operates is carrying a large part of burden and depreciation. Burden is thus re-distributed according to the importance of the operator under consideration. The total monthly burden, however must not be exceeded or underestimated. This is easily arrived at with little practice. The changes in a factory are not very numerous, and the whole thing will right itself quickly with a little observation. The cost card on a certain job would then look something like this:

Lumber W.P. 45 feet at 85	$3.69
32% of waste	1.18
Hardware (Store Order No. XXX)	.87
Time card	
Per cent. of overhead 15 min. at40	.10
Machine operator 30 minutes at 65	.325
Breaker up, 15 minutes at .55	.138
Percent of overhead 30 min. at 45	.225
Bench operator 3 hours at 40	1.20
Percent of overhead 3 hours at 20	.60
Cost of production	$8.328

Then there is the cost of selling, handling, carting, delivery, collection, advertising, etc., to be reckoned with, but we will not discuss them here for they can be ascertained from your daily experience.

These few remarks are made from actual experience in the application of costs in a large woodworking factory and while they are not complete they will demonstrate one easy way of distributing burden in a sash and door factory which is a bugbear to many millmen.

Copper Salts Improve Casein Glue

It has been found that copper salts added to casein glues greatly increase their resistance to moisture and also make them more durable when exposed to the action of molds and fungi. Casein glues containing copper are nearly as moisture resistant as blood albumin glues.

In the preparation of copper-casein glue at the Forest Products Laboratory, 2 to 3 parts by weight of copper chloride or copper sulphate are dissolved in about 30 parts of water and are added to every 500 parts of the ordinary casein, lime, and water glass glue. The copper solution is poured into the glue in a thin stream. The violet-colored lumps formed at first by the coagulation of the glue by the copper solution are reduced by stirring vigorously for about 15 minutes, and a smooth violet-colored glue results. It is necessary to add the copper salts after the other ingredients are thoroughly mixed, in order to obtain beneficial results. Copper added to the casein before the lime and water glass is ineffective.

Glues containing little lime are especially improved by the addition of copper. A low-lime glue with copper may be as resistant to moisture as a glue with more lime in it, and copper does not shorten the "life" or period of workability of the glue as much as more lime would.

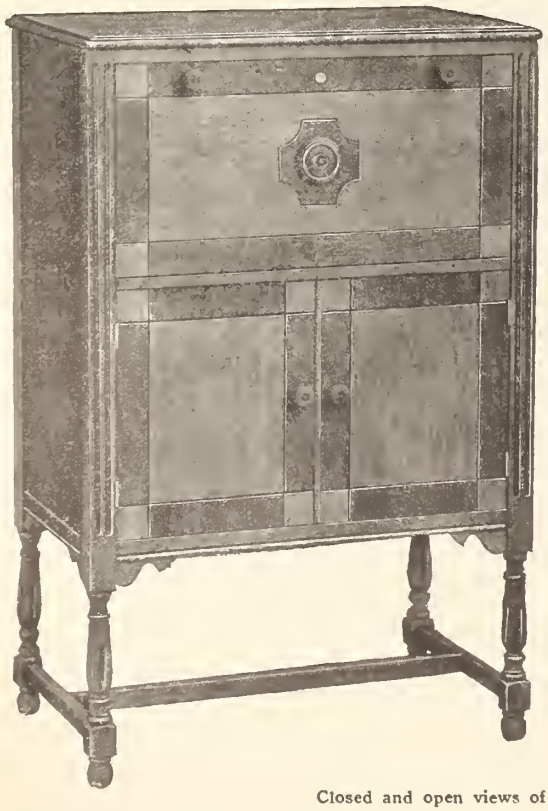
To get sense out of anything you must put some into it.

There is one advantage electricity has over all other powers; it can be taken and used in any odd corner at a very low cost.

Capitalize the Radio Craze!

Furniture Manufacturers Should Take Advantage of the Popularity of the Wireless Telephone by Marketing Cabinets for Radio Outfits—A Demand for High Class Cases

The growing popularity of radio can be made to work out to the benefit of furniture manufacturers and cabinet makers through the manufacture of radio cases; in fact several firms on the other side of the line have already seen the possibilities of good business in cabinets of this kind, and the suggestion seems to have an appeal to firms in Canada who are fitted for the handling of such business. A few months ago when the radio craze began to take the country by storm the apparatus was in many cases of a temporary and make-shift nature. However, so well developed has the science become within the last few months that the apparatus is now of a highly developed type—often quite intricate and expensive. In keeping with the development which has taken place in the design of the radio equipment itself, there has also been noted a tendency to improve the cases or cabinets in which such apparatus may be housed. In some instances radio apparatus has been installed in phonograph cases while, of course, the simpler equipment has been fitted with comparatively inexpensive boxes or cabinets. However, the wireless enthusiast, who has purchased or made a high-class set is no longer content with a cheap case for his apparatus. He wants a cabinet entirely in keeping with the class of apparatus he possesses, and for that reason there is now a growing demand for well-finished, high-class cabinets that will not only be adequate protection for the delicate radio machinery but will also be ornamental furniture for the home. Indeed the radio has become such a piece of home equipment that it behooves furniture manufacturers and cabinet makers to recognize the probable permanence of its popularity and to take advantage of the possibility of making it as handsome a piece of furniture as the phonograph has become in recent years. For that reason a little ingenuity can easily be exercised in the design of cabinets suited to radio requirements. These can be made as fancy and finely finished as the demand warrants; indeed it may reasonably be supposed that with the high quality of the radio equipment now being marketed, there will be a very keen demand for cases of the finest quality and workmanship. Just to indicate what may be done along this line we are showing two illustrations of a cabinet recently put on the market by the Maddox Table Co., of Jamestown, N.Y. The illustrations show a particularly handsome cabinet, both closed and open. In commenting on this particular design, the Maddox people say, "The development of radio has opened a new and rich field of profit for furniture manufacturers and dealers. Every radio set requires a cabinet." The design shown is made in oak, mahogany and walnut, waxed finish, two-tone. A sliding shelf admits of easy access to the rear of the apparatus. The upper section will house any type of radio apparatus and the lower space is ample for batteries, storage, etc. The cabinet measures 29 x 17½ in. in plan and 46 in. in height.



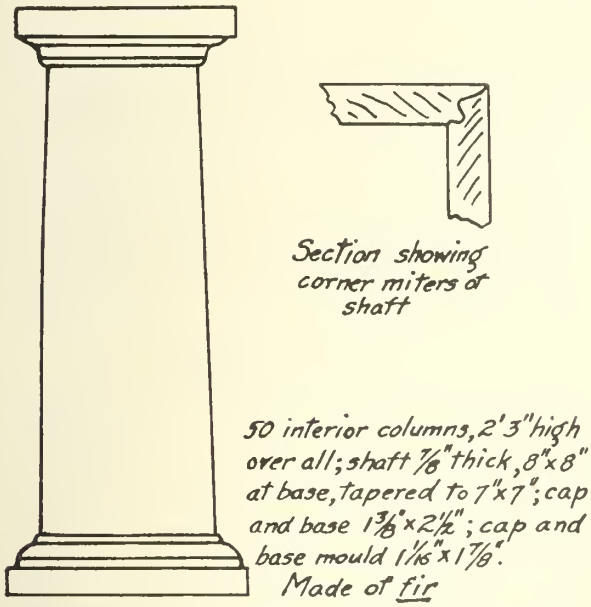
Closed and open views of a radio cabinet by the Maddox Table Co.

A Difference in Costs of 122 Per Cent

Why Should the Estimate of the Cost, Without Profit, of Fifty Columns Range Between $135 and $300?—How Can You Meet Competition Unless Estimating is More Intelligent?

The subject of the cost study this month is a job involving 50 interior columns, 2 ft. 3 in. high over all, 8 in. x 8 in. at the base, tapered to 7 in. x 7 in. at the top. The shaft is 7/8 in. thick and the cap and base 1 3/8 in. x 2½ in. The material is assumed to be fir. A number of millmen have submitted figures representing their respective ideas as to the true cost, without profit, of producing this order. These figures, which are tabulated below, certainly show some surprising features and admirably serve to emphasize the lessons which this series of articles is intended to point out.

The "Canadian Woodworker" feels that a great many millmen have no idea and do not know how to form an idea of what their costs are. We feel further that this is a situation that demands a serious attempt toward securing a remedy. The woodworking industry is no longer a hit and miss proposition. It is a well-established business that should be run on scientifically determined lines. The day has passed when a mill operator should determine whether he has made money only by analyzing his bank account at the end of the year. He should know from day to


Section showing corner miters at shaft
50 interior columns, 2'3" high over all; shaft 7/8" thick, 8"x8" at base, tapered to 7"x7"; cap and base 1 3/8"x2½"; cap and base mould 1 1/16"x1 7/8". Made of fir

The figures in the next column tell how costs are guessed at

day and on every operation whether he is running at a profit or a loss. It may be necessary under certain circumstances for him to run at a loss but, at least, he should know that he is doing so and that he is not under any misconception about the amount of money he is losing. Some operators are in the habit of running along month after month under the impression that a healthy surplus is accruing to their credit when, as a matter of fact, upon sizing up the business at the end of the year, they are surprised to find a loss that more or less seriously injures their business. We are all in the business to make money—not exorbitant profits or profits based on "putting something over," but at least a legitimate return for capital invested and labor expended. But a profit can only be determined if we sell our products at a price above what our outlay was in making them; in other words if our selling price exceeds our cost. This pre-

No.	Material	Waste	Bench hrs.	Rate	Machine hrs.	Rate	Commercial Burden	Total
1	$60.00	20%	25	$.90	25	$1.20	20%	$135.00
1a	64.35	10%	55	.75	15	1.50	25%	160.10
2	39.97	20%	50	.88	62	1.04	15%	170.72
3	60.00	15%	40	.95	50	1.25	15%	184.50
4	115.80	20%	30	1.00	12	1.50	20%	196.55
5	72.00	20%	60	.90	40	1.30	15%	197.80
6	52.47	10%	50	.85	50	1.50	20%	203.97
7	54.21	20%	47	1.00	61½	1.17	20%	207.80
8	58.20	15%	54	1.00	70	1.20	20%	235.44
9	55.80	20%	125	.85	40	1.07	20%	245.84
10	40.74	7%	100	.60	100	1.50	20%	300.89

supposes, of course, that we know our cost, but this seems to be the bugbear if we are to judge by the figures that have been published month by month in these articles.

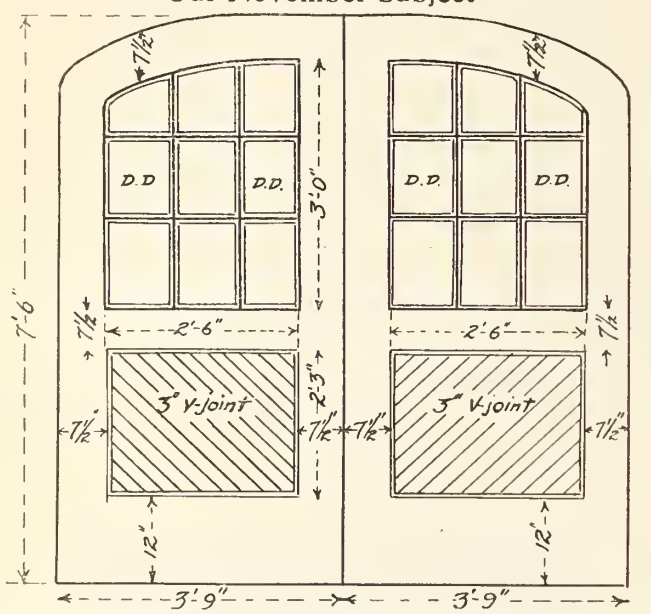
The wide disparity in many of the quotations naturally leads us to suppose that there has been some error in calculating the true cost. Making all due allowances for differences in conditions in different plants, there is no justifiable reason for the wide variance that is generally shown in connection with these cost studies. In practically every instance there are one or two firms who have estimated either extremely low and extremely high, while there are usually several who match up within close limits. It is probable that those whose figures come pretty close to the average are the ones whose estimates of cost are reasonably correct while it is almost safe to assume that the extremes are away out in their estimating.

This situation is just what all of us in the woodworking industry would like to improve, and the "Canadian Woodworker" has felt that one way of ultimately securing a better basis of costing is to throw a little light on conditions as they are. For this reason we have suggested certain jobs month by month and have obtained cost estimates from a number of mills that are qualified to handle the orders concerned. There is no thought of running down or belittling those estimators whose figures do not show any similarity to the average, but rather is it the object to use those figures only to point out the moral which we want to emphasize—that there is need for some improvement in costing methods if the woodworking industry is to be placed on the plane which its importance justifies and if woodworkers are to be able to make legitimate profits from their operations. In this policy we have been commended in letter after letter; in fact we are constantly being thanked for offering these comparative studies and thereby drawing the attention of some firms to the need of some improve-

ment in their system of estimating their costs.

In the particular study which has been selected for this month, a range of 122% in the total estimated cost of the job is evident—a percentage that is all too high if these estimates are based on a definite knowledge of cost data. In the individual factors which are involved in the estimate there is even more flagrant variation. Take material, for example. The estimates range all the way from $39.97 to $115.80 for the material required for these 50 columns. We admit that the estimator furnishing the low figure does not specify the amount of material necessary for the job, and so we cannot determine if he has made any error in taking off his quantities. That is a possibility, of course, for previous studies have shown that millmen, as a whole, need some instruction in quantity taking. The other estimates show practically the same amount of material in each case, the proportion of waste, however, varying from 7 to 20%, the latter figure being the more prevalent. The firm whose estimate was high, $115.80, put the price of the material at 50% above anybody else, which accounts for the unusually high figure.

Our November Subject



Readers are requested to submit their ideas of the cost of this pair of garage doors for the November issue. The doors are 2 in. thick and made of white pine.

On the question of labor the figures tell an interesting story. With bench hours running from 25 to 125 and machine hours from 12 to 100 there is surely something in error, especially when the firm that estimates a small amount of bench labor also estimates a small amount of machine labor. Quite frequently it is possible that one firm's estimate will show an unusually high amount of bench labor, but it should show a corresponding decrease in machine labor or vice versa. The rates charged for labor are fairly uniform, bench labor rates at from $.60 to $1.00 and machine labor at from $1.04 to $1.50. These figures are, of course, supposed to include burden which is one of the most difficult things to determine in woodworking operations. The importance of the proper establishment of burden rates is well emphasized in Bigelow's new book on "Management in the Woodworking Industry," in which he states: "One of the first steps in establishing cost is to work out the ratio of burden to the direct labor charges for the various departments of the business. This is to provide the mechanism for making a charge each month to the account representing work in process, to cover the burden applicable to the cost of the product, in proportion to the amount of direct labor incurred during the month." In this connection it may be interesting to point out that the Millwork Cost Bureau has just compiled returns from its members and determined a new burden rate based on conditions as they are at present. Up till now the average burden of the 500 members of the Bureau has been 57 cents per hour for machine help and 34 cents for bench labor, whereas now these figures are respectively 64 and 38 cents.

The Millwork Cost Bureau has made an estimate of the cost of the job shown in this month's study and their figures are given below for the sake of comparison.

Material				
Including 20% waste				$ 54.21
Machine Labor				
Ripping and Cutting	7	hours		
Planing (Pony)	8	hours		
Shaping	26.5	hours		
Belt Sanding	20	hours		
	61.5	hours	@ $1.17	71.96
Bench Labor				
	47	hours	@ $1.00	47.00
				$173.17
Commercial Burden 20%				34.63
Total Cost				$207.80

As several letters have asked us to continue this series, we shall take another job for November and ask our readers to submit their estimates of the cost at an early opportunity. The subject for study is comparatively simple but it is such a job as might be handled in almost any mill—a pair of garage doors of the design shown in the accompanying sketch. Will you not please submit an estimate for the sake of more accurate costs in the woodworking industry?

Varnish Hints

A brush mark or flaw in the first coat, unless removed, will show in the last coat no matter how many coats are applied. Each coat of material on top of a rough mark makes it more difficult to remove.

The durability of finishing materials increases, up to a certain point, with the number of coats applied. The priming coat is supposed to exclude moisture from the material underneath it, and form a receptive surface for subsequent coats. Hence it dries more quickly and harder than other coats.

How do You Pay for Your Labor?

(Continued from page 54)

In this way, maximum production is secured, for the rates are based on definitely-known, minimum operating times.

When the workmen are convinced of the stability of the rates and also of their fairness, they usually put their shoulders to the wheel and work with a will and spirit of co-operation seldom, if ever, found where a definite incentive is lacking. The result is a gratifying increase in production and, as a consequence, lower costs.

Is White Oak or Douglas Fir Best for Barrels?

After Making Comparative Tests the Forest Products Laboratory Draws Several Conclusions Respecting the Merits of the Two Woods —How Fir Staves Should Be Manufactured

Comparative tests of white oak and Douglas fir barrels are described in a recent issued report of the Forest Products Laboratory, Madison, Wis. This report outlines at some length the comparative merits of containers made of these two woods in the light of the results of a number of experiments carried out under the jurisdiction of the Laboratory, the various tests to which the barrels were subjected and the reactions that were obtained in the various processes being described and illustrated in considerable detail.

The barrels used in the tests are described as follows: The oak barrels were furnished by the St. Louis Cooperage Company, St. Louis, Missouri, and consisted of 48 barrels divided into six groups of eight barrels each; group No. 1, 5/8-inch stock, 6 hoops,; group No. 2, 5/8-inch stock, 8 hoops; group No. 3, 3/4-inch stock, 6 hoops; group No. 4, 3/4-inch stock, 8 hoops; group No. 5, 7/8-inch stock, 8 hoops. The barrels were made from quarter-sawed white oak. The material was practically straight grained and free from defects. The barrels were of excellent workmanship and were well coated with paraffin on the inside. The staves varied in width from about 2½ inches to about 7 inches. The heads were usually composed of four pieces, though two heads each were composed of three pieces. The pieces of the heads were joined together with 5/16-inch hickory dowels. The Douglas fir barrels were furnisted by the Western Cooperage Company, of Portland, Oregon, and consisted of thirty-three barrels divided into three groups of eleven barrels each which that company in their forwarding letter, described in the following terms: "The stock in these packages is sawn from No. 1 Douglas fir timber and represents our No. 1 grade 3/4-inch oil staves and our No. 1 grade 20-7/16-inch heading in 3/4 and15/16-inch thickness. There are to be thirty-three barrels forwarded to Madison, eleven of which will be hooped with six hoops and headed with 3/4-inch head; eleven more hooped with eight hoops and headed with 3/4-inch heads, and the balance to be hooped with eight hoops and headed with 15/16-inch heads. All heading used in these packages have glued joints, and the packages were set up from average stock the same as received from our mill, there being no special selecting."

The barrels, in each case, after being filled with water, were subjected to the following tests: Side compression, diagonal compression, internal pressure, side drop, and diagonal drop. Charts were used to plot the progress of each test, and voluminous memoranda notes taken of the various points of strength and weakness developed by the containers while under the different treatments applied. A mass of valuable data was secured which should prove of incalculable value to both manufacturers and consumers in determining the relative value of white oak and Douglas fir as cooperage stock. The following notes are taken from the summary as it appears in the report:

Oak Barrels

In each kind of test the first water to appear on the outside of the barrel was usually from the seepage through the pores of the wood at the chime. The first leak usually occurred either between the staves and the head or between the staves at the chime. In all the tests except the internal pressure the first leak was usually coincident with the slipping of the staves.

In the internal-pressure test there were two general classes of failures: (1) By springing and breaking of the head; and (2) by leaking between the staves at the bilge.

In the diagonal-compression test the failure was a general failure of the head combined with the slipping of the staves. In the compression-perpendicular test the failure was a general leaking at the heads and slipping of the staves followed by the breaking of the staves at the bilge.

In the side-drop test the slipping of the staves caused loosening of the hoops and leakage at the heads. This was followed by breaking of the staves at the bilge. In three of the six tests the failure of the barrels was due to the heads being broken or forced out by the pressure produced by the impact.

The lower heads of all barrels tested by dropping on the chime were broken or forced out by the pressure due to the impact.

Douglas Fir Barrels

First leakage in nearly all tests was in one of two ways: (1) water passing completely around the edge of the head and appearing on the outside of the barrel in the angle between the head and the chime or projecting end of the stave: (2) water passing partially around the edge of the head and thence though the pores and appearing as small drops on the edge of the chime. Leakage of the first type is described as "leakage at croze," and the second as "seepage through chime." There were very few instances in which there was leakage between the staves except after the barrel had been quite severely deformed as in the side and diagonal-compression tests. In the diagonal-compression tests leakage due to crushing of the edge of the head occurred at a fairly early stage. As a special test barrel No. 13 was so placed that the end grain of the head came at the point of pressure, and, leakage did not occur until later.

Aside from the first leakage, types of failures differed, of course, with the kind of test.

In side and diagonal-compression later failures were by slipping in stave joints and shear or splitting of staves, combined with opening of the joint between staves and head with splitting of head.

In this test there were numerous instances in which staves split or sheared their entire length. In fact, it seemed to be almost as easy for this to occur as for staves to slip on each other at the joints. This applies also to side and diagonal drop tests.

Final failure in side drop and in diagonal drop tests was the driving out of the head by the shock of the contents.

Final failure in internal pressure tests was by breaking or bursting out of the heads.

At first leak in side compression, the Douglas fir barrels take only about two-thirds of the load carried by the white oak barrels. The white oak barrels, however, begin leaking at a much smaller deformation than do the Douglas fir, and the product of load and deflection at first leak is in every case of comparison higher for Douglas fir than for white oak. These facts indicate that when subjected to shocks against the bilge, the Douglas fir barrels, although they develop less force before leakage, yield much more (or farther) and can absorb fully as great a shock as the white oak. It should be noted in this connection that a common practice is to store or stow barrels on their sides with the bottom row blocked at the quarters and upper rows laid in the "cantlines," or space between barrels of the row below and with the bilges above the heads of the row next below. It is to be expected that barrels arranged in this manner will sustain considerably larger loads than are found in the side compression test.

At first leak in diagonal compression, Douglas fir barrels take less load than white oak barrles. Here again, however, white oak barrels stand much less deformation than the Douglas fir, with the result that shock-resistance as indicated by product of load by deflection is practically equal for barrels of the two species.

The Douglas fir barrels average about three-fourths as high as the white oak in drop (both side and diagonal) at first leak. Approximately the same ratio applies to drop to produce leakage at the rate of one pound of water per minute.

When subjected to internal water pressure the Douglas fir barrels develop two or three times as great pressure at first leak as do the white oak barrels. The pressure required to produce leakage at the rate of 1 pound of water per minute averages about 30 per cent higher for Douglas fir than for white oak.

Conclusions

The following conclusions apply only to white oak and Douglas fir barrels and in the combinations of number, quality and dimensions of hoops and thickness of staves and heads as used in the tests described herein.

1. In the oak barrels, increase in thickness of stave is of much less value than increase in head thickness, and it is to be expected that oak barrels with 5/8-inch staves and 7/8-inch heads will prove fully as serviceable under many conditions as barrels with 7/8-inch staves and heads.

2. In Douglas fir, barrels with 15/16-inch heads and 3/4-inch staves are superior in resistance to internal pressure to barrels with 3/4-inch heads and staves.

3. When there is little change in moisture content, as in these tests, the eight-hoop barrels show but little superiority over six-hoop. When barrels are subjected alternately to moist and dry conditions and the consequent tendencies to swell and shrink, it is to be expected that the advantage of the eight-hoop barrels will be enhanced.

4. When barrels of both species are well and carefully made of properly-selected stock they compare as follows:

Douglas fir barrels have about two-thirds as great resistance as do white oak barrels to leakage under steady loads as in the bottom of storage piles. However, Douglas fir barrels probably have sufficient resistance to carry safely such loads as are likely to come on them in storage or shipment. The Douglas fir barrels, moreover, possess the ability to be deformed to a greater extent without leakage than the white oak. Resistance to shock is proportional to the product of load and deformation, and the Douglas fir and white oak barrels are practically equal in this product, indicating that when loaded on end in railway cars they may be expected to withstand equal switching shocks without leaking. After leakage has begun the steady force and the shock required to cause increased leakage is greater for white oak than for Douglas fir barrels.

When dropped upon the chime or upon the bilge, the Douglas fir barrels withstand without leakage about 25 per cent lower drops than white oak; indicating somewhat greater susceptibility to damage from rough handling in rolling or sliding down skids.

The Douglas fir barrels withstand from two to three times as much internal pressure before leaking as do the white oak barrels.

5. The Douglas fir barrels tested were made with 17 gauge by 1¾-inch and 18 gauge by 1½-inch hoops in order to have them like the oak barrels tested and to comply with I.C.C. specification No. 10. As Douglas fir is softer and exerts less force in swelling than oak, it is not certain that these sizes are necessary. Further tests would be required to determine the safe and most economical size of hoops for Douglas fir barrels.

Tests Were Made With Barrels of Best Quality

In connection with these comparisons of the white oak and Douglas fir barrels it is to be remembered that all barrels tested were of selected stock and well manufactured. The oak staves and heading were white oak, which is much more resistant than red oak to penetration by liquids. Because of this quality and because of other properties, such as greater stability of form and shape under changing moisture conditions, and greater resistance to decay, white oak, when clear of sapwood is recognized as much superior to red oak for barrel making. The Douglas fir barrels were from timber selected because of its special suitability for barrel manufacture. These points are mentioned to bring out the fact that the barrels tested were such as can be made only through careful attention to selection of timber and to manufacturing details, and that the white oak and Douglas fir barrels tested were of corresponding quality.

The results of these tests lead to the conclusion that with carefully-selected timber and carefully-manufactured barrels, white oak will excel Douglas fir barrels in serviceability under ordinary shipping conditions. However, white oak barrels, if of indifferently selected stock containing sapwood or defects, or if carelessly manufactured, may be expected to be much less serviceable than Douglas fir barrels well made of properly-selected material.

Selection of Timber and Handling of Stock

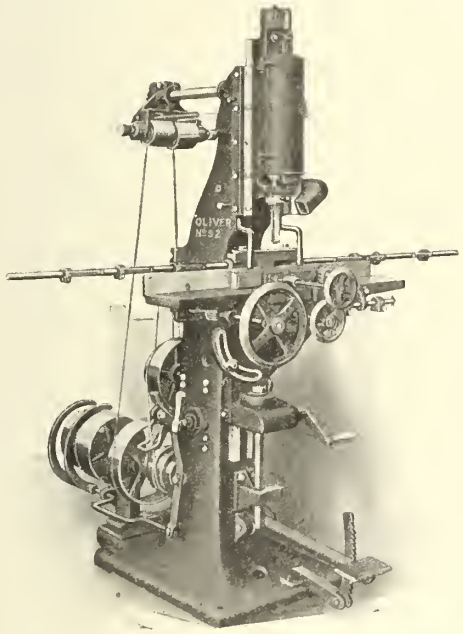
The selection of timber and handling of stock is carried out with great care by the larger manufacturers of Douglas fir barrels, and it is desired to call attention here to a number of points bearing on the making of barrels of the best quality from the species. These points have been developed from the experience of manufacturers, observation of the barrel tests described herein, mechanical tests of Douglas fir,

(Continued on page 68)

Machinery & Equipment

A New Power Feed Hollow Chisel Mortiser

A new power feed hollow chisel mortiser, known as the "Oliver No. 92," has recently been put on the market by the Oliver Machinery Co., Grand Rapids, Mich. This new equipment is designed to meet the demand for greater production than is possible with foot-feeding machines, and is particularly useful in factories engaged in multiple quantity manufacture of cabinets, furniture, sash and similar woodwork. A number of advantages are claimed by the manufacturers who especially draw attention to its flexibility, convenience, dependability, economy and compactness. Chisels from ¼ inch to 3/4 inch square can be handled and the stroke is adjustable from 2½ to 4 inches long. Stock 6 inches wide can be centred beneath the chisel.



The "Oliver No. 92" power feed mortiser"

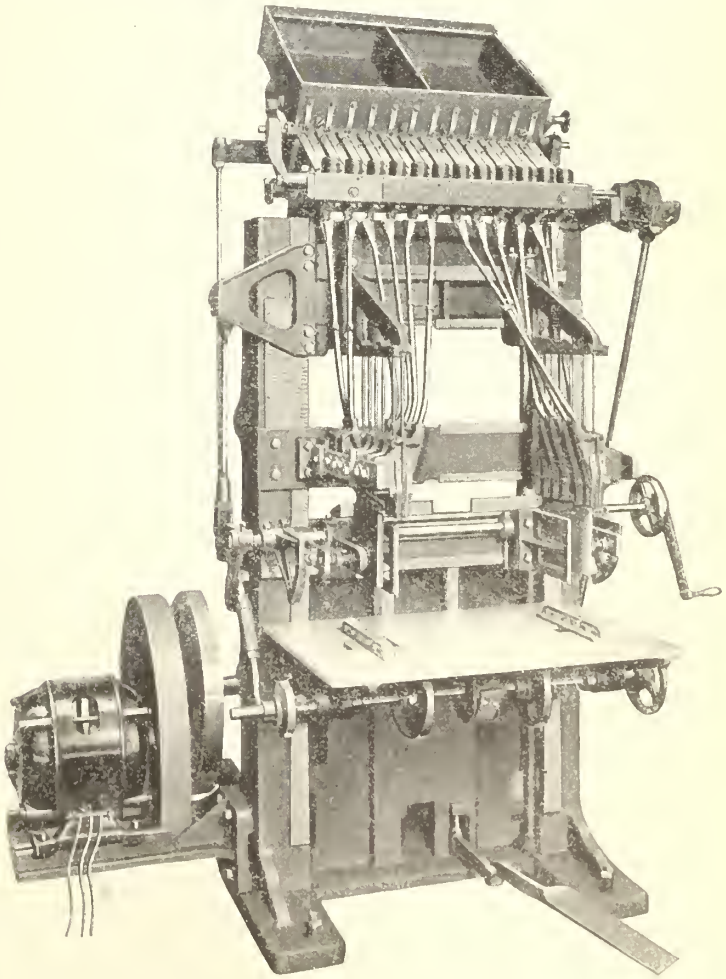
The mechanical construction of the machine is of the latest design, with the column enclosing the power feed mechanism with the exception of the drive pulleys. A built-in fan blower back of the column furnishes a constant air blast which cools the tools and keeps the work free from chips.

The power feed mechanism is extremely simple, being controlled by the foot lever and brought into action by a belt tightener which when released brings a brake into action on the rim of the drive pulley. A ratchet is provided to hold the lever down for continuous feeding. The power feed has three rates of feet, 18, 26 and 36 strokes per minute, by means of cone pulleys and a feed belt shifter. By throwing out the ratchet the continuous feed mechanism may be instantly stopped and the machine operated by single strokes. A universal combined table with screw clamp for 6-inch wide stock and hand wheel, rack and pinion for longitudinal travel, gauged by adjustable stops, is regularly furnished.

The machine may be obtained and fitted for belt or motor drive. In the latter case the usual drive consists of locating a 3 h.p., 1,200 r.p.m. motor on a bracket in place of the tight and loose pulleys, and coupling same to the drive shaft which carries the pulleys to the spindle, the fan and the power feed mechanism. Where 2 or 3 phase, 220 or 440 volt, 60 cycle current is available a motor-on-arbor type of machine may be employed. In this the countershaft and idle pulleys are eliminated entirely and the machine is driven by two motors, one a 1½ h.p., 3,000 r.p.m. motor directly on the spindle, and the other a 1 h.p., 1,200 r.p.m. motor direct connected to the cone pulley which operates the power feed mechanism.

Double End Box Nailing Machine

Something new in the way of a box nailing machine has recently been brought out by the P. B. Yates Machine Co., Limited, Hamilton, Ont. This is a double end box nailer which will nail a box together in three strokes with the exception of the lid,



New nailing machine manufactured by P. B. Yates Machine Co., Ltd.

providing it is end-nailed, that is, that the sides and bottom are nailed to the end pieces. The side can be nailed to the two ends in one operation, as the sides are nailed to the ends of the box simultaneously. The machine's capacity is limited only by the skill of the operator.

Another feature of the machine is that it can be arranged to nail combinations, such as four nails on the bottom and sides at each end, or four nails in each side and six in the bottom at each end. This variation in the nailing makes it adaptable for nailing boxes which are shallow in comparison with the width. Specially designed clamps for holding the ends of the box while being nailed also effectively straighten warped or crooked stock and align these pieces with the ends and the side. These clamps open and close automatically.

The machine can be driven by direct-connected motor or by belt. It is designed for box makers who end-nail their boxes and especially for nailing together apple boxes, pear boxes, butter boxes and the regular types of boxes used in the canning trade.

The accompanying cut represents the new double end box nailing machine, this particular one being the No. 12 A.B. machine, the number of the machine designating the number of nails that can be driven at one time.

Is White Oak or Douglas Fir Best for Barrels?

(Concluded from page 66)

and field observations of its properties and peculiarities:

1. It is believed by barrel manufacturers that material of suitable character can be secured only from trees grown in low-lying regions or so-called fog belts.

2. Staves of the Douglas fir barrels tested had an average of about 23 annual growth rings per inch. The minimum number was 7 and the maximum 44. It would probably be well to require that staves should have not less than 8 growth rings per inch.

3. It is recommended that Douglas fir bolts be converted into staves and kiln-dried as soon as cut from the logs, in order to avoid the rather rapid deterioration that may occur through the checking of short bolts in drying.

4. It is of prime importance to have staves as nearly as possible perfectly quarter-sawed or edge-grained. Incipient ring shake or weakness of bond between the annual rings is a type of defect rather frequently found in Douglas fir. Where this occurs in a stave having the annual rings at angle of less than about 60 degrees with its surface, slippage along the rings having such weakness is very likely to happen. It is recommended that in specifications for tight barrels of Douglas fir a limit be set to the deviation from perfect edge grain. The following is suggested as a simple and practical statement of the deviation:

"Staves must be so manufactured that the annual rings at any point do not deviate a line perpendicular to the face of the stave by more than one-half of the thickness of the stave."

The cutting of staves in this manner has a further advantage, since the shrinkage of quarter-sawn stock averages from one-half to two-thirds as great as that of slash grain material. For this reason barrels made of quarter-sawed staves shrink and swell less with change in atmospheric and moisture conditions and give less trouble with leakage. This is true of all species. The tendency to shrink and swell as well as strength properties are factors to be considered in comparing the suitability of various species for tight cooperage. The shrinkage or swelling of quarter-sawn stock with a given change of moisture content is practically the same for oak and Douglas fir. Consequently, it is to be expected that troubles with shrinkage and swelling will be least for the barrels whose staves are most perfectly quarter-sawed.

Why so Few Apprentices in Planing Mills?

Editor, Canadian Woodworker:—

I appreciate the interest you are taking in the apprentice question but think that there have been some misconceptions as to the progress we have made regarding this matter.

It has been discussed in a rather offhand way at two of our meetings, without any apparent solution having been offered. I will confess to being very much interested in this problem, but do not pose to be an authority on its solution by any means. There are several reasons why our boys are not interested in the planing mill business, some of which can be remedied by ourselves and some cannot.

In the first place, our industry has been one which has about as many failures to its credit as any line of business I could mention, and those of us who have survived, have done so by practicing strictest economy. We have paid ridiculously low wages to our mechanics, and a boy who is looking around for something to make his life work, has invariably passed us up, and can you blame him? This can be remedied by our charging a price for our products which will enable us to pay a decent wage, and make working conditions more agreeable thereby making the woodworking mechanic proud of his occupation.

A man is not going to learn a trade unless he feels assured that the remuneration he will receive will allow him to provide a comfortable living for himself and family. It is all very well for some of our visionary individuals to talk "guild," but in order to make it attractive, a prospective student must see a decent living ahead. We are bringing up our boys to live differently than they did a generation or so ago. I am a firm believer however, in preparatory school training, but you must have subjects to train. Many of our boys have a desire to be in the white collar class. This condition in my estimation will right itself in time.

Another reason why the workman does not take more interest in his work and encourage his boys to follow in his footsteps, is the curse of unionism, which we have had to contend with. If a boy in starting out, tries to make a record for himself as the the quality and quantity of the work he is turning out, he is invariably called where unionism reigns.

These things which I have mentioned, are only some of the problems we will have to solve before making any great stride toward encouraging our boys to become planing mill mechanics. I might say however, that we have in our employ, three or four boys who seem to be working out fairly well, which is rather encouraging.

C. E. Cowdin,

Portland, Oregon. Secretary, Northwest Millwork Association

Upholstering and Trimming

Further Variations in Down Upholstering

Description of the Operations Involved in Covering an Arm Chair in Which New Ideas Are Introduced

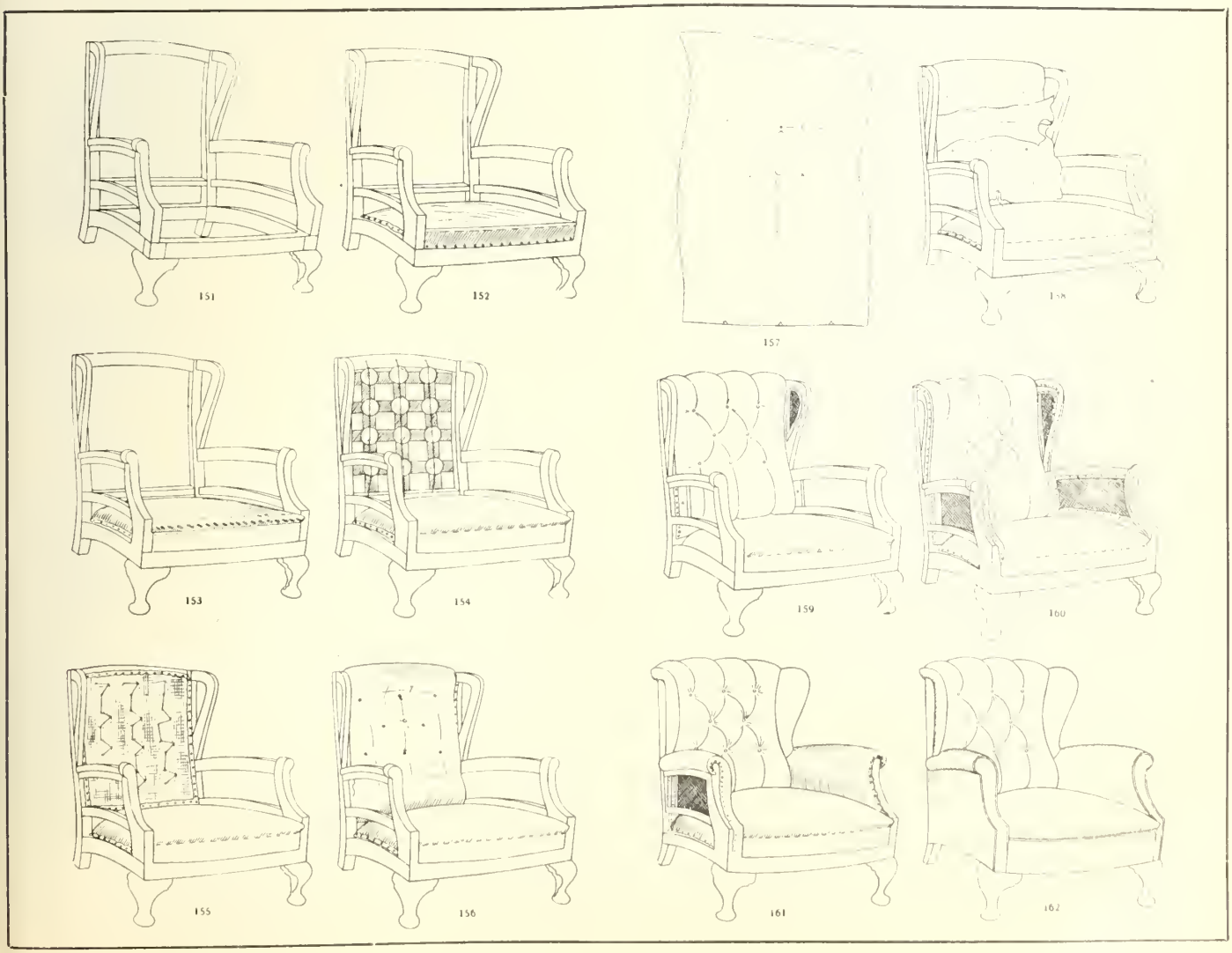
The chair frame illustrated in Fig. 151 is usually made with a buttoned back, and in order to vary the explanation of the use of down upholstering, as given in previous issues, we are treating the upholstering of this chair in a very different way from those already covered in this series.

The seat is upholstered with a spring edge, the wire of the spring edge being kept flush with the front of the frame as shown in Fig. 152. The stitched edge, which forms part of the double stuffing, is allowed to project about one inch beyond the wire as illustrated in Fig. 153.

The back of this chair is webbed on the outside for pillow springs which are lightly sewn to the canvas as shown in Figs. 154 and 155. A light double stuffing is next brought over the back to act as a foundation for the buttoning. The back is marked for diamond tufting on a basis of about 7 by 9 inches as shown in Fig. 156.

A down pad containing about one inch of down is made according to the size required for the back as shown in Fig. 157. An allowance of one and a quarter inches is allowed for buttons between tufting points and one and a half inches all around for filling and tacking. This makes the pad about five inches wider than the back and about four inches longer, but these allowances are only approximate, actual measurements would have to be made on the chair itself.

Now, with the pad as a covering muslin, having been marked for buttons, the back of the chair is stuffed up in the ordinary way for diamond tufting, the pad forming a soft top stuffing but being handled just as a covering muslin would be handled, being



careful to keep the top and bottom covering of the pad in their proper relationship.

It is a good plan to mark the button points on both the top and bottom of the pad. This is best done by punching the marks through with an awl while the pad is stretched out on the table for stuffing. This gives a mark on both the top and bottom which can be kept in line as each tuft is pulled into place. See Fig. 158.

After the back has been completely tufted and the edges tacked as shown in Fig. 159, the arms and wings are canvassed leaving space where each joins the back so that the covering of the back can be brought through and tacked to the back side rail as indicated at the left of Fig. 159. Blocks are placed between the top and bottom rails of the arm as shown at X in this figure and a wire is put in the back edge of the canvas of the wings and securely tacked.

The next step is the nosings for the arms and wings which are applied after the manner we have already illustrated in connection with Figs. 26 to 33.

The chair will now have the appearance of Fig. 160. The arms and wings are lightly stuffed so as to obtain the greatest degree of softness as shown in Fig. 161 and the completed chair trimmed with welts and panels is illustrated in Fig. 162.

Good Light Important in Upholstering Shop

Impossible to Accomplish Good Work in Ill-Lighted Work Rooms—An Abundant Supply of Natural Light Necessary to Match Fabrics

A trip through the average furniture plant will demonstrate to the visitor how little concern is given to the matter of light in the upholstering department, and yet in no trade is a good supply of both natural and artificial light more essential than in that of the upholsterer. Very frequently the upholstering department is forced to accommodate itself in a basement or some out-of-the way corner where the only daylight is that which struggles through window areas or small, inadequate light wells. Of course, the manufacturers attempt to augment the scanty supply of natural light by installing some form of artificial lighting, but even this is usually so inadequate as to be practically useless.

It has been recognized that the lack of good light seriously interferes with the quality of workmanship and with the health and producing capacity of the workmen, but it almost appears as if the upholstering shop is the last to be studied in this connection. How often do we see bright surroundings in the finishing department and in some of the cabinet-making sections of the plant, but, on the other hand, dingy and dull quarters for the upholstering staff.

It is almost needless to say that it is impossible to accomplish good work in ill-lighted shops, and there are many reasons why this state of affairs should not exist to-day. Bad light is often the indirect cause of faulty construction in upholstery work, especially in the case of leather, velvet and shaded fabrics. Frederick Palmer, a well-known English instructor in upholstering methods, comments on this phase of the subject as follows:— "In the case of leather work it is impossible to shade and blend the skins. The reader may easily test this for himself. Let him examine, say, an easy chair in Morocco first in artificial light and then in daylight. In the former the leather may appear to be one color; in the latter he will find maybe five or six different shades that cannot be toned together correctly in artificial light. The work in such conditions is liable to look patchy and to offend the eye. Velvets are very difficult to match up by artificial light. Some of them possess four distinct shades by reversing back to front and right to left, and where many cuts are to be made mistakes soon occur. All this shows how necessary it is that the upholsterer's shop should be one where a maximum of daylight prevails, and a minimum of artificial illumination.

"The right to work in a good light is one upon which the upholsterer should always insist. It means all the difference between a good and a bad week financially, to say nothing of the inevitable effect on the quality of the work done.

"Next to light, a good benchway, with plenty of space, is important. It often happens that where coverings for the work in hand are not available, the upholsterer may have several jobs in progress at the same time unfinished. Hence, the need for plenty of room, especially where there are many men employed. A side-bench, about 4 ft., 6 in. wide and 3 ft. 6 in. high, fixed beneath the windows, with divided bins beneath for the various stuffings, serves the double purpose of a cutting-board and a place for unfinished work. The bins should be boarded up half-way, and divided into 5 ft. or 6 ft. lengths.

"Trestles should be about 36 in. wide and 30 in. high with grooved tops, to insure a frame remaining rigid when placed on them. It is necessary to have a high pair and a low pair, the latter to be used for settees or chairs with extra high backs; they will also be found useful in many other ways.

"Cutting-boards for marking out should be made about 6 ft. 6 in. by 4 ft. for the large, and 3 ft. 6 in. by 5 ft. for the smaller sizes. These should not be of too soft a wood, as with the constant hammering and pritchawl holes, the wood soon splinters, and the board becomes useless."

Practical Points on Finishing

Don't overload the surface with liquid filler, varnish, enamel undercoating or enamel. If you do the result will be a thick coat that will crack and flake off. In using liquid fillers, enamel undercoatings or enamel, in order to insure the adhering or gripping of the coats to each other, see that they are thoroughly mixed. Thin coats mean quick hardening.

To avoid an uneven appearance, exert the same amount of pressure all over the work. Hold the brush at right angles to the face of the work, which is thus touched by the end of the brush only.

Don't dip the brush too deeply, nor allow any of the finishing material to enter the stock of the brush. If you do you will spoil the brush as well as the work; the material up in the stock of the brush can not be removed easily and will harden there. This will get the brush out of shape and cause tiny particles of the hardened material to deposit on the work, making it specky.

Eagle-Ottawa Leather Co.

TANNERS OF

FURNITURE LEATHER

OF EVERY DESCRIPTION

We are making a specialty of cutting

Spanish Split Leather for Chair Manufacturers

Quotations and samples furnished on application

We will be pleased to supply a very attractive sample book, of all our grades on application.

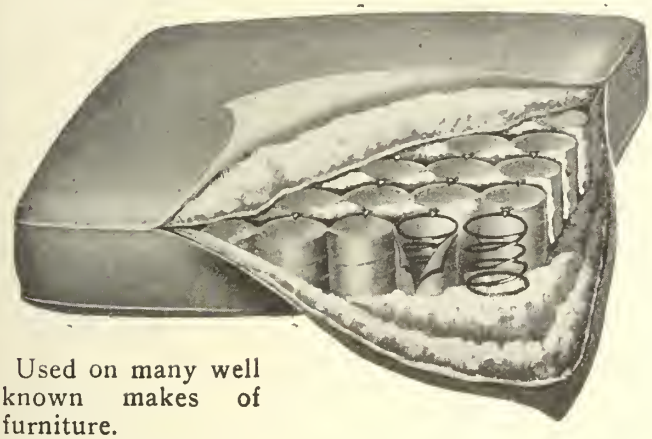
GRAND HAVEN - - - - - MICHIGAN

"COMFY" CUSHION COMPANY

Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.



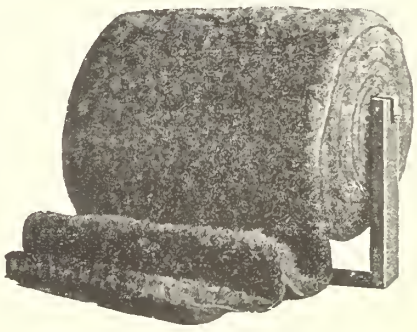
Used on many well known makes of furniture.

Write for Catalogue

"Comfy" Cushion Co.

340 Gerrard Street, East, TORONTO, Can.

Woven Curled Hair



LOOSE-CURLED HAIR

In All Grades and Colors

Samples Cheerfully Furnished

BLOCKSOM & COMPANY

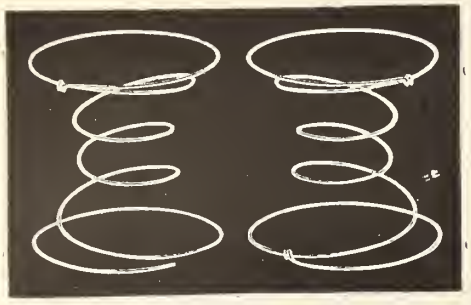
Sterilized Curled Hair

MICHIGAN CITY, INDIANA

Here's a Suggestion

Do you ever try keeping a file of your back copies of the "Canadian Woodworker"? Try it. Start with this issue. There are many articles that are worth keeping, as they offer valuable suggestions that will help you in your business.

"IDEAL"
FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,
of Canada, Limited
Windsor - Ontario

MARIETTA WOOD AND METAL FINISH SPECIALISTS

For Breakfast Room Furniture

The enamel finish in various colors has become deservedly popular.

Marietta
Colored Enamels

have been greatly in demand with manufacturers. Made in **Ivory. Delft, Blue, Yellow, Mauve, Mahogany, Pink, French Gray, Jade Green,** etc.

Write for panels.

The Marietta Paint and Color Co.
Marietta, Ohio
Southern Factory - High Point, N. C.

"Save the surface and you save all"—*Paint & Varnish*

D&P

QUALITY

CURLED HAIR GLUE SANDPAPER

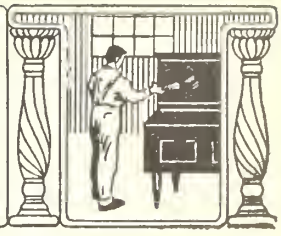
DELANY & PETTIT LIMITED

TORONTO.

OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC

THE FINISHING ROOM



Mechanical Equipment Supplants Hand Methods

The Modern Finishing Department's Efficiency is Vastly Increased by the Use of Varnish Sprayers, Machine Rubbers and Similar Devices

It was not so many years ago that the finishing department in the majority of plants was practically devoid of mechanical equipment of any kind. The various operations from the first filling or staining to the final rubbing and polishing were all performed by hand. All this has changed, however, so that today the reverse holds true, and in the finishing room of some of the more up-to-date factories practically all the operations are performed mechanically.

One of the most far-reaching developments in this direction was the perfecting of the spray machine. This was originally sold for applying varnish with the aid of compressed air but the tendency in recent years has been toward applying all finishing coats with the "varnish sprayer." In many plants today, practically all the materials used, filler, shellac, enamel, varnish and lacquer, are applied through the spray gun.

This practice is not as widespread as it might be, but at that the trend is toward an ever-increasing use of the spray equipment. In some plants, where the output warrants it, separate spray machines have been put in operation to handle each kind of material. Thus one machine is kept going on stains, another on shellac and so on. There are certain advantages to this practice, for not only is each machine permanently adjusted to handle one particular class of material, but the operators become skilled in applying and working with one class of finishing material with the result that both work and material are handled to the best advantage. In other plants where the volume of work going through does not warrant such a large number of machines, each sprayer is used for more than one finish, although it is customary to provide separate hose and "guns" or nozzles for the various materials. This does not mean a separate hose and nozzle for each finish applied but it would hardly do to handle white enamel through equipment that had just been used for applying stain or filler.

More Work When Spray Equipment is Used

The head of one finishing room recently remarked that he was thoroughly sold on the idea of applying all finishes with spray equipment and had adopted this standard practice in his department. He has found that each spray machine will turn out as much work as from four to eight finishers and in many cases the coats are applied with greater uniformity. In the case of certain stains it is often advisable to have a finisher stationed near the spray booth to brush the articles as soon as they are sprayed. This results in an even distribution of the stain and takes care of any runs that might otherwise occur.

He intimated that his policy was to break in green operators rather than attempt to train finishers for the work. His reason for this was that not only do skilled finishers often object to operating a sprayer but in addition, they usually have a number of fixed ideas as to how various finishes should be handled and applied, with the result that they are not prone to follow instructions and the work often suffers. Green hands follow fully and carefully all instructions, have no preconceived ideas either with regard to the way the various materials should be handled or with regard to the quantity of work which should or should not be put through. When once broken in and trained they usually make the best operators, turning out a satisfactory volume of well finished work.

Other pieces of equipment that are aiding production in finishing departments are special rubbing machines. These may be either portable or stationary and driven by air, electricity or belts. In many plants all the larger flat surfaces are machine rubbed and often light portable rubbers are used on the smaller surfaces. However, while such equipment saves considerable in time and money, hand rubbing is not entirely eliminated for it is usually found necessary to have hand rubbers follow the machine and in addition there are many places the machine will not touch. As in the case of spraying equipment the output of the department can be materially increased by using rubbing equipment wherever possible.

This reference to the finishing room equipment would not be complete without some mention of special drying apparatus. Not only does the use of varnish drying kilns give complete control of the drying operation but it permits the development of drying schedules which may be followed without any noticeable variation. Under the old regime a coat of varnish, for instance, might require anywhere from twenty-four to seventy-two hours to dry, depending entirely on atmosphere conditions. With the drying apparatus in use, every day is an ideal drying day with the result that the average drying period runs usually from eight to twelve hours. This equipment conserves both time and space and permits the finishing department to be put on a regular production basis, working on a definite schedule.

No mention has been made of special conveying equipment, usually in the form of everhead carriers, or of special dipping machines. These can hardly be classed as regular equipment although each might be used to advantage in the average plant. The day may come when even these labor-saving devices may be found in every finishing department but for the present the development is toward the use of spraying, rubbing and drying equipment to an ever-increasing extent.

Modern Finish Drying Schedules

With Up-to-date Equipment and Accurate Control of Humidity and Temperature, the Time of Drying is Reduced and Greater Production Ensured—Conveyor Dryrooms

This article follows the one in the last issue entitled "Night Finishing a Waste of Time and Space."

How the small modern dryrooms can be adapted to the highest grades of finish is illustrated by the following figures and Diagram No. 3. In a plant formerly equipped with the old style box oven, no attempt being made to control the humidity of proper circulation, records show that the average schedule is as follows:

Stain applied in the daytime, dried overnight;

Filler applied in the daytime, dried overnight;

Shellac or shellac substitute applied in daytime, air dried overnight;

First varnish coat applied in the daytime, dried overnight;

Second varnish coat applied in daytime, in dryroom overnight; air dried twenty- four hours;

Third varnish coat applied in daytime, in dryroom overnight; allowed to set six to eight days before rubbing.

Time in finishing department, fifteen to seventeen days.

With modern drying equipment to insure the proper circulation, and accurate control of humidity and temperature, the following schedule can be maintained every day in the year:

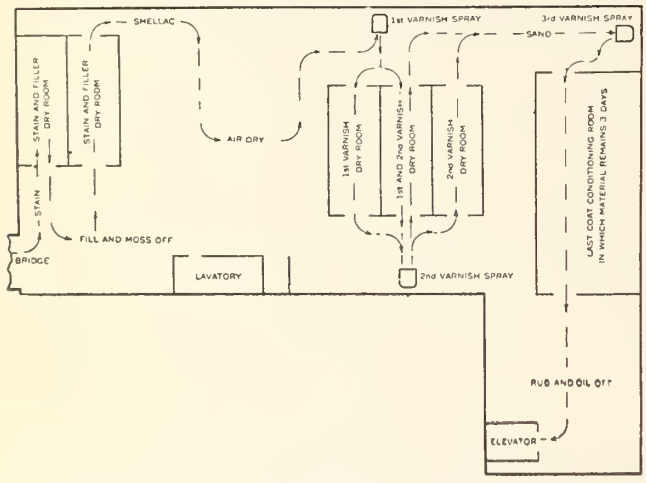


Diagram No. 3—Small modern dryroom, adapted to highest grades of finish

First day—Stain and filler, two drying operations, 120-degs. temperature, 38-40 percent relative humidity.

Second day—Shellac-sprayed in daytime, air dried over night.

Third day—First varnish coat applied in daytime, dried from six to eight hours, by 10 p.m. of same day, at 116 degs temperature, 40-42 percent relative humidity.

Fourth day—Second varnish coat applied in daytime, dried from six to eight hours, by 10 p.m. of same day, at 116-degs temperature, 40-42 percent relative humidity.

Fifth, sixth and seventh days—Third varnish coat applied in daytime, then allowed to remain in the conditioning dryroom for three days, temperature in same being approximately 108-degs. and 48 percent relative humidity on the dry bulb and 88-degs on the wet bulb.

By this schedule, work removed from the conditioning room can be immediately rubbed, making the total finishing time seven to eight days. The release in material in the course of production is over 60 per cent. In one case where this type of equipment was installed, there was a release of over 160 piano cases on a daily production of 16 to 20 cases.

Another example of dryroom installations which applies to a large number of manufacturers, is what is known as the "alternate arrangement" whereby one air washer-humidifier and heating equipment takes care of two dryrooms, as in Diagram No. 4.

For manufacturers whose output is varied, and whose mill equipment will not permit a very close schedule day to day, this alternating arrangement offers the very best solution for the finishing room drying problem. With this system there is generally a dryroom ready to receive the material as soon as it is coated, and floor space which would normally be used for air-drying storage becomes a dryroom housing. The drying equipment is designed to take care of one room, but the productive dryroom area is equal to one and a half times the total dryroom space.

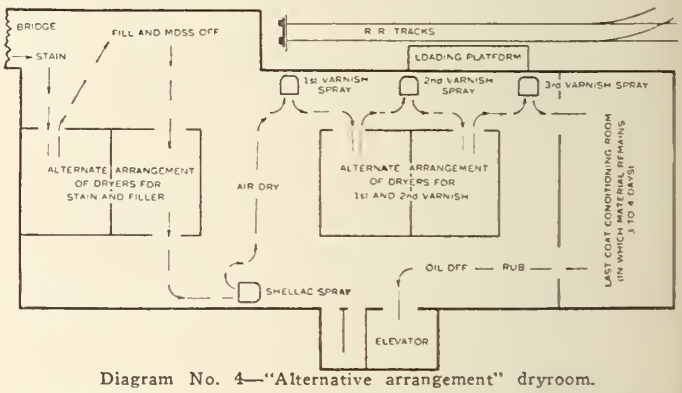


Diagram No. 4—"Alternative arrangement" dryroom.

Last Coat Conditioning Room

The last coat conditioning room shown on Diagrams No. 3 and No. 4 was specially developed to meet the requirements of the phonograph cabinet manufacturers, who are required to finish a definite number of cabinets every day, but many of the leading furniture manufacturers have also seen the advantage of this method of conditioning the last coat, over the conditioning of the entire finishing room.

In general, the method of operation consists in building a dryroom with sufficient floor space to hold from three to five days' production, depending upon the quality of finish and number of coats. Each day's output is placed in a certain space or row as it is coated, and there it remains for a definite period under temperature and humidity conditions until removed to the rubbing deck.

The average time for medium grades of finishes is three days, at a temperature of 112-deg. on the dry bulb and 90-deg. on the wet bulb. Certain long oil finishes require five days, and special piano finishes seven days; but in every case the time formerly required between the application of the last coat and the rubbing application is cut in half.

The investment for the last coat conditioning room equipment is very much less than for equipment to condition properly the entire finishing room. The cost of operation is also decidedly lower because all the space is utilized for drying, there be-

ing no waste space above the articles. The heat losses are negligible on account of the relatively low temperature required.

The last coat conditioning room eliminates the atmospheric variations which occur when coatings are allowed to stand between the last coat and the rubbing operation. These variations are caused by the cooling down of the factory temperature during the night time in the winter months and the high increase in the relative humidity during the night time in the summer months and are generally recognized as one of the main causes of poor finish and delays in the finishing process.

In the last coat conditioning room, by holding the coating at a constant temperature and humidity during the night time as well as the day time, these variations do not exist and there is the big saving in the rubbing operation because the surface is absolutely free from dust and dirt.

Diagram No. 5 illustrates the two types of conveyor dry-room now in use for the drying of finishes in the woodworking industry.

There are many types of finishes and many instan-

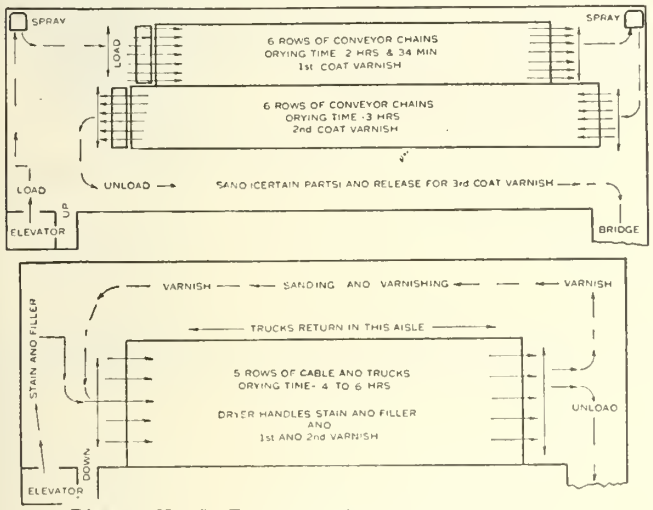


Diagram No. 5—Two types of conveyor dryrooms.

ces where there is sufficient quantity production to warrant the installation of conveyor dryrooms in the woodworking industry and so far the number of installations has been extremely limited. One of the reasons has been the high cost of the conveyor equipment on account of the length of time in drying. The other has been the lack of knowledge on the part of the purchaser on how to make a time study of his work so as to proportion the dryroom to take care of as nearly as possible the average amount of material per daily output.

The advantages of drying on a conveyor are self-evident to anyone who has seen one of these systems in operation.

The productive dryroom area is 100 per cent. It is always a dryroom, there is no loading or unloading. The proper temperature and humidity can be so regulated and arranged in zones within the dryroom so that the coating is dried under ideal conditions and more rapidly than in the box type.—By C. H. Currier, in Veneers, Indianapolis.

The varnish brush should be selected with a view to the size of the surface that is to be coated—a large brush for a large surface and a small brush for a small surface. A varnish brush that is too small for the job will cause rough work.

A Few Practical Varnish Pointers

Heavy-bodied varnish should not be brushed out much; it should be applied in a full, flowing coat.

Varnish demands light and air in order to dry right, and appears to dry faster in daylight than in darkness. Some say two to one.

The varnished objects require warmth until perfectly dry, this especially in chilly weather. Do not place a freshly-varnished job in a cold or cool room.

Cleanliness in every part of the work is necessary in order to insure good work. This means everything clean.

If the varnish is too thin it will not produce a full-bodied coating, while a too-heavy-bodied varnish will not flow out well. Light-bodied varnishes flow out well and do not show the brush marks as heavy varnish is apt to do.

Before varnishing be sure that the surface is free from dust or dirt, grease or moisture, these things causing blotching. This blotching may also be caused by thinning the varnish with turpentine and not getting a perfect mixture. Blotching is also called pin-holing.

Ordinary varnish may be said to require twenty-four hours for drying, but some others will demand two or even three days, and this the expert varnisher understands. Some varnish will dry very soon, upon its surface, while certain others will dry all the way through, but will require more time.

Putty and Puttying

The economy of quality is demonstrated in the purchase of putty. Good putty goes further, is much easier to use and gives more satisfactory results than poor putty. Adulteration of putty with fish, mineral and rosin oil is common. Its detection is easy; the oil will separate after standing in the package for about fourteen days and come to the top when it may be easily compared with linseed oil. Putty made with linseed oil turns hard after a reasonable time to a uniform mass without the oil separating. Another good test for putty that has a mineral oil odor, is to make a small cone of the putty and touch a lighted match to it. If it has been made of mineral oil it will burn like a candle.

Sand and marble dust are also used to adulterate putty and in excess quantities will cause it to crumble. Sometimes adulteration can be detected by reducing the suspected sample to the consistency of paint. By pouring this on glass and working with a putty knife, grit will immediately be noticeable if sand or marble dust is present.

The adulteration of putty will retard the drying of finishing materials and cause white enamel to turn yellow.

Good putty will cling well, dry well and can be sandpapered easily. It is poor policy to add additional drier to the putty as furnished by the manufacturer because this will usually cause it to contract in drying and sink, leaving a depression as well as a crack at the edge.

Putty should be pressed into the holes evenly, applying neither too much not too little and so spreading and finishing off without rims at the edges that little sandpapering will be required.

Putty should be as nearly as possible the same

color as the surrounding finish. A flexible knife should be used in applying, being careful not to dig into the wood. To prevent rims at the edges, a piece of cloth is sometimes used. Ridges left to harden will be hard to remove. Pressing the putty well in makes it less likely to sink or swell. Care must be taken that the putty does not dry too hard, because in that case it is apt to contract in drying and sink, leaving a depression as well as a crack around the edges.

When finishing in the natural finish most finishers make the putty a little darker than the wood, as most woods darken with age.

Should you have an accumulation of dried-out putty, by cutting these lumps into small chunks, and placing in a pail of water, just enough to cover the putty and adding a little oil, allowing it to get quite warm, even hot, on the stove, the putty will absorb the oil and the water may be poured off.

To make putty dry hard, add a little plaster of paris or red lead or use turpentine with the oil when mixing. Where putty fails to dry hard, owing to non-drying mineral oil being used as an adulterant, use red lead or litharge to dry it.

Dusted Walnut Finish

The wide popularity of walnut is bringing out experiments in individuality and efforts to produce special effects. One of these is what is termed dusted walnut, with which also goes a polychrome finish on some of the solid foot and frame work that goes with the walnut paneling. The idea back of it seems to be to get an age rather than an antique effect by a special treatment that shows a whitish dusting here and there and this, combined with the polychrome stain effect, is being pretty strongly featured now. It is probably an outgrowth of the desire to get individual character in the furniture, and whether it will grow into wide use or become merely a passing fad remains to be seen.—Veneers, Indianapolis.

You are worth what you earn. When you are worth more you will earn more.

A good factory lumber inspector is one of the best investments a manufacturer can make.

If a circular saw was put on the ground and run at the same speed as it does in the bench how many miles would it travel in a day?

No Telescope is Necessary

to see the quality of our Reeds and Rattans, and they sell at very attractive prices. We also supply the trade with Cotton Waste and Cotton Linters. Let us quote on your requirements. Write, wire or phone today.

E T. CARTER & CO., LIMITED
84 FRONT ST. E., TORONTO

The wood finish that will not paper mark in shipment

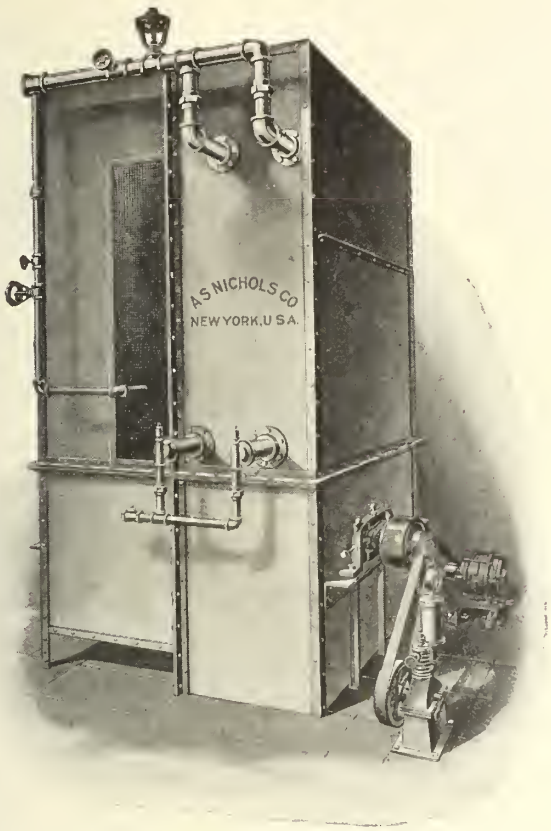
A product finished with ZAPONITE, the Pioneer Wood Lacquer, is proof against the harmful effects of paper marking when wrapped and packed for shipment.

Being extremely hard and uneffected by moisture, heat and climate changes, a ZAPONITE finish never gets "sticky," it never paper marks and it never shows the imprint of burlap wrappings—another reason why ZAPONITE is the ideal finish for quality products made from wood.

Let our Service Division help you to determine how ZAPONITE can be used in finishing your products at a SAVING in your production costs. Write us about this service TODAY.

Celluloid Zapon Company
200 Fifth Avenue, New York City
Branches: Chicago, New Haven, Los Angeles

THE PIONEER ZAPONITE WOOD LACQUER



Vertical Equipment Floor Space 4 x 6 ft.
Crated and shipped complete ready to set on the floor outside of your varnish room

You Are Paying for This Equipment—

While using old fashioned Varnish Drying methods. The money you are losing will more than pay for this equipment in one year.

This statement is based upon a fact well known to manufacturers in every branch of the wood working industry.

IT IS A COMPLETE UNIT of fan, motor, heaters, air compressor, with automatic humidity and temperature control.

is manufactured in sizes suitable to all requirements, both vertical and horizontal.

eliminates dust and dirt by the use of a new humidifying air washer without the use of sprayheads, pump and pipe connections.

will triple the output of your finishing rooms—practically eliminates sanding.

will decrease congestion in your factory.

will reduce investment of goods in process.

will improve working conditions for your employees.

"SET IT OUTSIDE YOUR VARNISH ROOM"

A. S. NICHOLS COMPANY

Aeolian Hall

33 West 42nd St., New York City

Manufacturers of dryers for lumber, veneers, glued stock, varnish, paints, enamels, etc.

Increasing the Speed and Decreasing the Cost

of Your Finishing Room Operation

How practical, how advantageous and how dependable DeVilbiss spray-painting equipment is, has been demonstrated in finishing rooms of every size and line.

Not merely in dozens of finishing rooms, but in thousands of them. Not only where a few different kinds of articles are handled, but where every kind, size and grade of wood or metal product is finished. Not alone where varnishes, enamels or lacquers are used, but where every kind of liquid finishing material is applied. The

DeVilbiss

Spray-painting System

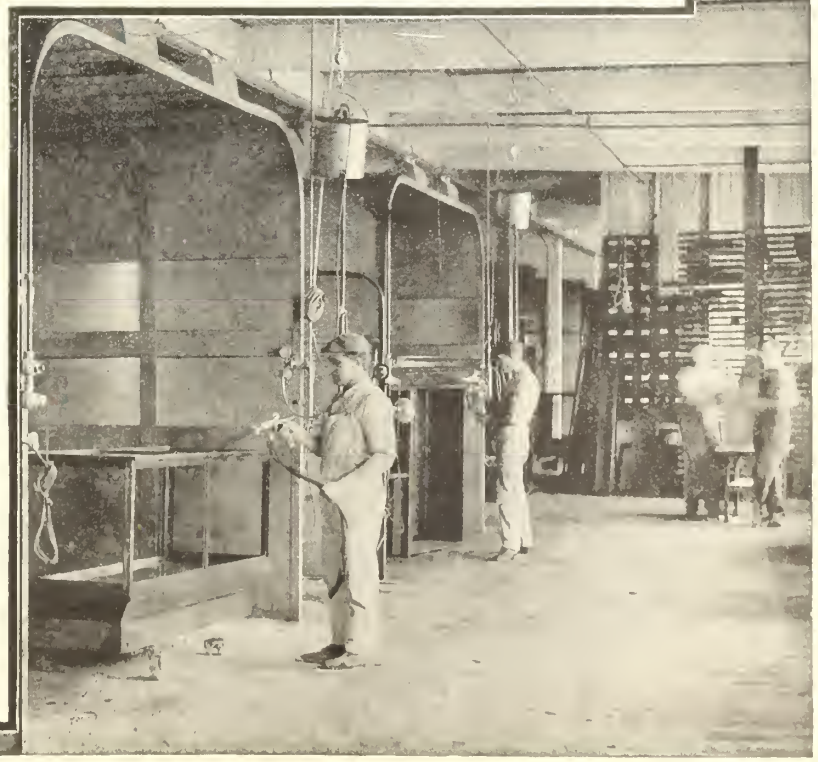
offers a complete, adaptable and guaranteed service. The finishing operation is speeded up 4 or 5 times over hand-brushing. A perfect, uniform coating is applied on all jobs. Working conditions are made more healthful and safer. Operating and upkeep costs are reduced to the minimum.

With your consent, we'll gladly tell you whether and how the DeVilbiss System can be of service and profit to you.

The DeVilbiss Mfg. Co.

3718 Detroit Ave. *Toledo, O., U.S.A.*

Paint your factory walls faster and better with the DeVilbiss Spray-painting portable equipment—let us explain.



BeVeCo VENEERS

The New Standardized Shade

"Brown Bird's-Eye Maple"

As Featured During the Summer Markets

HAVE you received your panel showing this new standardized shade, Brown Bird's-Eye Maple? A color that your foreman can easily produce when he once sees a sample panel.

You will agree, when you see Brown Bird's-Eye, that it is the most striking and beautiful wood obtainable for two-tone effects, bedroom suites, inlays, overlays, decorative panels, novelty furniture—in fact wherever rich contrasts in warm color tones are desired.

Nature has ornamented Bird's-Eye with a figure which cannot be duplicated. And now the craftsman's experience has enriched the handicraft of Nature.

We will be glad to have your finishing house send a sample panel that will show you exactly how striking an effect you may obtain with this new finish. This, of course, places you under no obligation.

BIRD'S EYE VENEER COMPANY
ESCANABA, MICHIGAN

"Brown Bird's-Eye Maple"

Veneers and Panels

The Core is Where the Trouble Often Lies

Furniture that is Supposedly High-Grade is Frequently Marred in Appearance Through Faulty Core Drying

By S. H. Johnstone

"What makes the best core for veneered tops?" was the question a furniture manufacturer fired at a lumber salesman the other day. "A perfectly dry one," came back the salesman. The reply was unexpected, for the furniture maker thought the lumberman would name some one species of wood as his choice for core work. There is little doubt but that it is important to make a wise selection in choosing lumber for this foundation work, but of even greater importance is to make sure that it is perfectly dry.

In many plants the commonly accepted conception of a core is that it is something to be covered up and as a consequence any kind and grade of wood that will hold together is usually worked into the cores. This same attitude of, one might say, contempt is also largely responsible for the fact that little, if any, attention is given to the condition of the stock itself. By condition is meant its dryness.

Finished Product Spoiled by Poor Cores

In selecting lumber for this work the stock must be reasonably sound and should be free from large knots and large checks. While it is true that the core is totally covered and is thus hidden from view, it is also true that the beauty of what would otherwise have been an attractive veneered surface is often marred because of some defect in the core. This was brought forcibly to my attention the other day when examining a handsome and expensive dining-room suite. The design, workmanship and finish of this exquisite suite was all that could be desired but in a certain light I noticed that the perfection of the top was marred by a defect due to a large knot in the core stock. From the appearance of the top the knot had been knocked out and the hole filled with some compound. The result was as I have stated. Had this been a cheap suite of furniture, one could at least understand, if not excuse, how a core of that kind might have been allowed to go through, but in the production of high class furniture where quality rather than initial cost should be the prime consideration, it is unexecusable. Nor do those things just happen. Rather they indicate a weakness somewhere. It would appear that those responsible either do not know or do not care. Ignorance or carelessness of this kind is not a legitimate excuse.

Some of the more common defects to be noticed in veneered work are sunken joints, wide depressions running lengthwise of the work and a wavy, washboard appearance. All of these are due to an uneven distribution of moisture in the core at the time it was surfaced and thicknessed. If all the pieces going into a core are not uniformly dry those that contain the most moisture are going to shrink the most as they come into equilibrium with the rest of the core and with surrounding conditions. It often happens that this equalizing or drying does not occur until after the stock has been veneered and sanded. The result is that when the drying and equalizing does finally end, one or more depressions are to be be found on the veneered surface of the work. The remedy is to as far as possible put none but uniformly dry pieces into core work and then as an extra safeguard plan sufficiently far ahead to allow plenty of time for the moisture in the stock to equalize before planing or sanding is done. When this is done it is likely that there will not be any more trouble from sunken joints, for these in turn are due to too much haste in surfacing after the joints have been glued.

I have seen cores taken from the clamps as soon as the glue has set sufficiently to hold the work together and run through the planer. It stands to reason that the wood on either side of each joint is in an expanded condition, due to the moisture absorbed from the glue, and when this wood finally dries out or equalizes, after being planed, narrow depressions commonly known as sunken joints, form along each joint. If the veneering operations have been rushed this shrinking often does not occur until after the surface has been veneered and finished, in which event the sunken joint becomes plainly visible on the finished surface.

Make up Cores Well in Advance

It should be possible to establish a number of standard sizes for multiple cores, that is cores which will cut without excessive waste into a number of different sizes. If that were done it would be practical and advisable to keep a number of these multiple cores made up well in advance. When an order comes along the multiple cores that would cut to the best advantage would be selected and worked up. By following some such idea as this would be quite feasible to make up all cores well in advance, as it would not be necessary to carry a large stock of individual sizes.

If this is not considered to be workable it might be well to get out the cores for each lot, and joint and glue them before an attempt is made to break out any of the other parts. It is a mistake to try and rush the cores through to the veneer room. More than that it is not enough to allow them to be stacked around the shop for a few days but they should be carefully piled on trucks with sticks between each piece and given a chance to dry as well as equalize.

Giving a little extra attention to core work in this way would add very little to the cost of production, probably not enough to show on the cost records, but it will make a real difference in the appearance

and saleability of the finished article. More than that, as the general public come to know what to expect in veneered furniture and refuse to buy that which does not come up to the mark, the producers of veneered articles will be forced to give more attention to the cores. It is not, however, advisable to wait until sufficient pressure is applied to compel that none but perfect veneered work be placed on the market. It would not take very much effort in the way of educational publicity and constructive salesmanship to put over in a big way, a line of really well built veneered furniture. A good market avails the individual or organization that first sells well made veneered work on its merits.

Methods for Making the Adhesive Strength Test of Glue

Several Methods that Have been Proposed are Described in Detail—A Rough Test for Use in the Glue-Shop

By R. H. Bogue, Ph.D.*

On account of the many factors which enter into any test upon strength, on account of the skillful technique necessary in order to obtain reliable and comparable data, and on account of the rather elaborate equipment required for properly making the test, the strength test has not received the universal attention in glue evaluation that might have been expected. In lieu of the actual strength test many other tests upon certain properties, as jelly consistency, viscosity, and melting point, and analyses for certain chemical groups, as α gelatin, β gelatin, etc., have been proposed as being true indications of the real strength value. One or another of these propositions have been quite generally accepted by the glue trade, and as a result very few consumers include an actual strength determination in their specifications. One of the exceptions to this has been the specifications of the National Advisory Committee for Aeronautics for glue to be used on airplanes, but the tests were made by the Service at the Forest Products Laboratory.

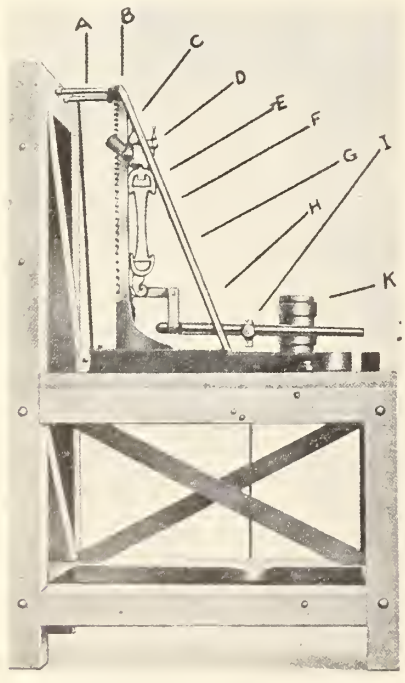


Fig. 1 (a)—The breaking machine used by Kahrs

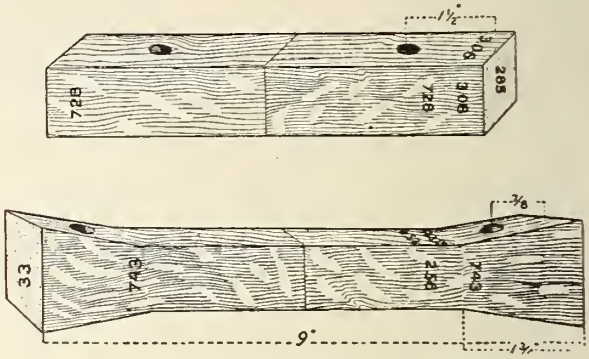


Fig. 1 (b)—The test pieces used by Kahrs

The methods that have been proposed for making the strength test are briefly described below.

Kahr's method.—Kahrs used blocks of well-seasoned oak, glued end to end, the area of the joint either 1 square inch or 1.44 square inches (one hundredth part of one square foot). The length of the former type of block was 4½ inches, and a shoulder was left at the end away from the joint to impart greater strength. The blocks were glued together after a careful weighing and measuring and varnishing, placed between clamps and later broken apart. For this purpose holes were bored near the ends of the blocks, steel pins inserted, and by means of an improvised machine, pulled apart. The machine used was of a lever type, the placing of weights at various

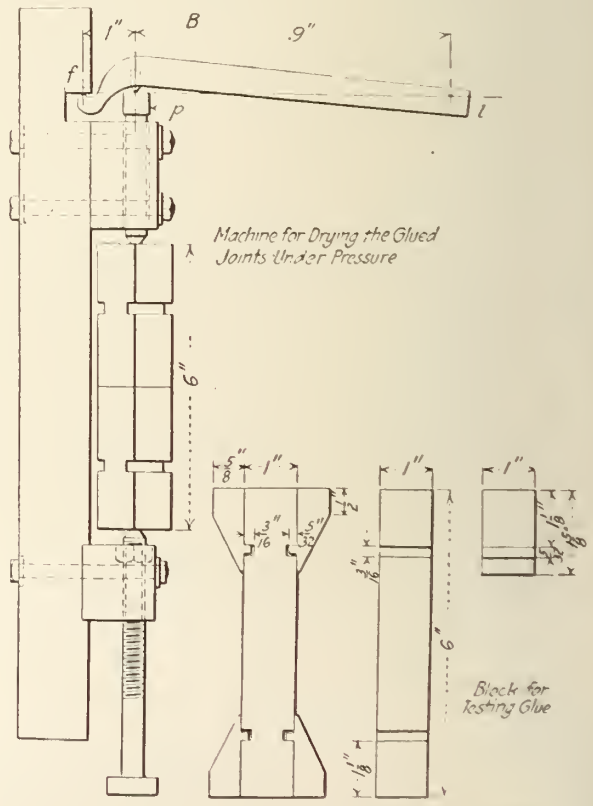


Fig. 2—Gill's apparatus for testing adhesive strength

*Formerly Industrial Fellow of the Mellon Institute of Industrial Research and Research Chemist for Armour & Co., Chicago; now on the staff of Lafayette College.

This article represents a part of the section of the "Glue as an Adhesive" in the writer's treatise on "The Chemistry and Technology of Gelatin and Glue," published by the McGraw Hill Company of New York.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

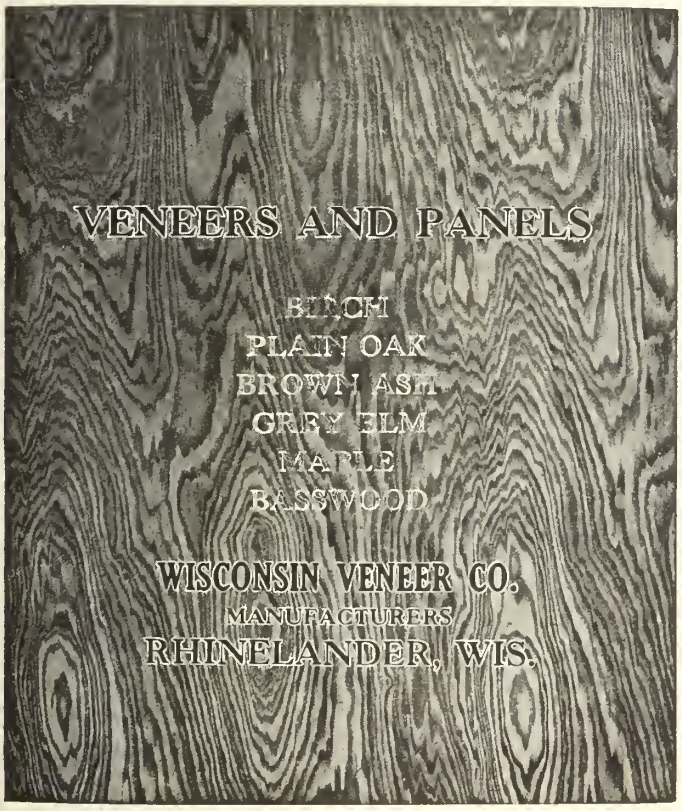
Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.



Litton Veneer Co.

Office and Mill Rockford, Illinois

Manufacturers

American Walnut Veneer and Lumber.

Plain and Figured Veneers of All Kinds.

Grand Rapids Office & Sample Room
192 Monroe Ave.
In charge of HUGH L. CURREN

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.
"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.
(When writing mention Canadian Woodworker)

points on the lever arm exerting a measured pull at the joint. The blocks and machine are illustrated in figure 1.

Gill's method.—Gill first made briquettes of fuller's earth, diatomaceous earth, quartz sand, and sawdust, using glue as a binder. These were dried at 80 degrees for 6 days, and broken by the well-known cement briquette testing machine. Difficulty was experienced in drying completely, the briquettes were full of blow-holes, and no consistent results could be obtained.

Gill then used rectangular prismatic maple blocks, sawn into a special form as shown in figure 2 and having an end area of one square inch. The blocks were glued end to end, and a uniform pressure secured by placing in a frame wherein the pressure employed was determined by placing weights on a lever arm bearing upon the joint. The pressure was maintained for 3 hours, and the joints allowed to dry at room temperature for 2 to 4 days. They were then pulled apart in the cement testing machine, after the ends had been blocked up with bronze blocks to fit the briquette holder of the machine.

Rudeloff's method.—Rudeloff applied the glue solution to the planed end surfaces of two pieces of red beech wood, 185 mm. long, 125 mm. broad, and 50 mm. thick, and placed the blocks so that the glued surfaces crossed at right angles. A definite joining pressure was used, and "the force required to tear

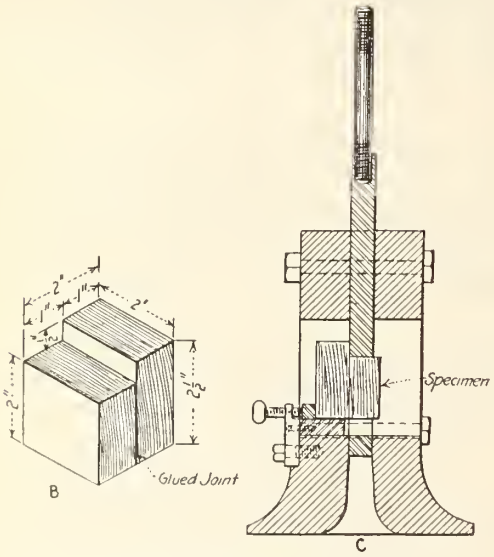


Fig. 3—The shear block test specimen and testing tool used by the Forest Products Laboratory

the pieces of wood apart measured by means of a suitable machine." He later used both edge and flat grain joints of beech, ash, oak, and fir, using 50, 40, 33-1/3 and 25 per cent glue solutions at a joining pressure of about 5 kg. per square centimeter, (about 65 pounds per square inch). Individual tests varied as widely as from 63 to 102 kg. per square centimeter.

Forest Products Laboratory method.—The method developed by the Forest Products Laboratory at Madison, Wis., is as follows: Two blocks of hard maple about 1 by 2½ by 12 inches in size are glued together, subjected to a definite pressure, allowed to dry out for a week, and cut into blocks as shown in figure 3. The glued area of each block is exactly 4 square inches. One of the two pieces is permitted to extend a half inch beyond the other to facilitate the technique and prevent a slip in the shearing process. The blocks are broken by placing in a shearing tool, as shown in the figure, in which pressure is applied upon the end of the smaller block until the joint separates. This pressure is most conveniently obtained by the use of a universal testing machine, by which the exact pressure at the breaking point may be read directly.

If the break occurs entirely in the glue, a measure of the strength of the glued joint is obtained, but if,

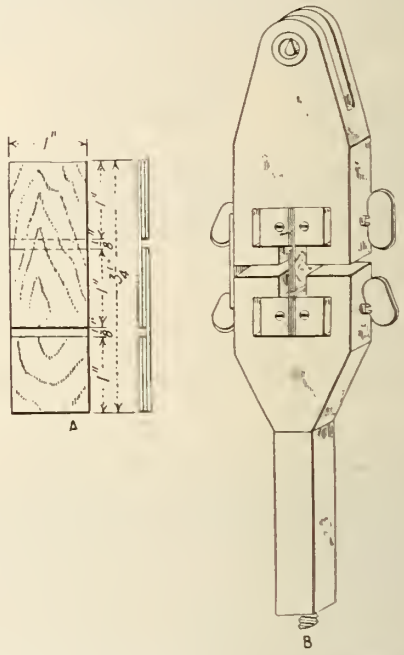


Fig. 4—The plywood test specimen and plywood shearing tool used by the Forest Products Laboratory

as frequently happens, the break takes place partly or wholly in the wood, the breaking pressure is less than the strength of the glue, and in order to obtain more exact data the test must be repeated with a stronger wood. The shearing strength of hard maple,

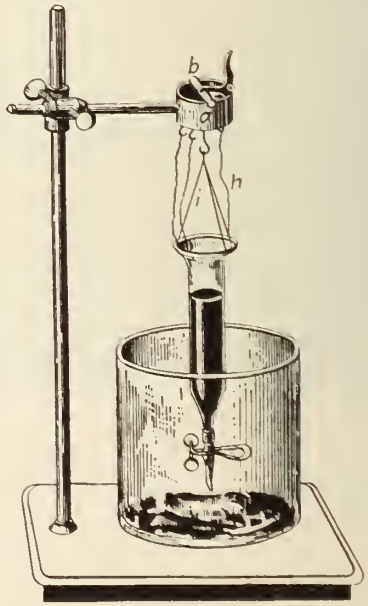


Fig. 5—Wiedenbusch's strength test

using similar blocks, is about 3,200 pounds per square inch, so the exact strength of glue which is stronger than this cannot be measured upon maple. The results obtained by this method are reasonably satisfac-

(Continued on page 90)

TRADE MARK

NICKEY BROTHERS INC

LUMBER VENEERS

NB

NONE BETTER
MEMPHIS
TENN.
U.S.
A

N.B. OAK VENEER

A Superior Product

NICKEY BROTHERS, INC.

MEMPHIS, TENN.

N. B. Oak Veneer--
A Superior Product

BRANCH SALES OFFICES:

618 Stewart Building
ROCKFORD, ILLINOIS

214 Professional Building
JAMESTOWN, N. Y.

Our claim to superiority is not based on the flimsy reason that it is good because WE make it. Our Veneer is superior because of certain definite operations that make it a better article. A thoughtful analysis will verify these statements.

N. B. Veneer is put up in a workmanlike manner. It is a clean, merchantable product. Defective or split ends are CUT OFF—not marked out with crayon. Dead or stained sap, or otherwise defective edges are ripped off. We leave the waste here, giving you a refined article.

We guarantee our measurements. Our inspectors are careful, accurate and thoroughly experienced. We welcome a remeasurement of our flitches. A comparison with other manufacturers will impress you favorably with our methods of measuring.

We maintain a critical inspection department. Every flitch is stamped with inspector's initial, and branded N. B. This maintains the identity of our Veneer, symbolizes the responsibility we assume, and is emblematical of the pride, skill and painstaking care that prevails throughout our entire operation.

N. B. Veneer is worth the price asked.

Concentrate Your Purchases and Save Money

Through Buying

Sliced Figured Red Gum and Rotary Cut Gum Veneer
Sawed and Sliced Ash, Poplar and Gum Grand Piano Rims
Sawed and Sliced Quartered Oak

In Cars with Band Sawed Hardwood Lumber

Carload Buyers get closer prices, save freight on local shipments and eliminate damaged goods

NICKEY BROTHERS, INC.

MEMPHIS, TENNESSEE

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y

HOFFMAN BROS. CO.

ESTABLISHED 1867 INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car	1/20′ Red Oak (log run)
½	Car	1/16′ Red Oak (log run)
½	Car	1/20′ White Oak (log run)
½	Car	1/16′ White Oak (log run)
1	Car	1/28′ Walnut (half round)
25M		1/28′ Poplar Crossbanding
5	Cars	1/8′ Poplar (log run)
2	Cars	1/8′ Poplar (corestock)

Prices by wire on receipt of your inquiry

HB

Reg. U.S. Pat. Off.

FORT WAYNE, IND.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

The Standard Veneer Co.

Portland, Maine

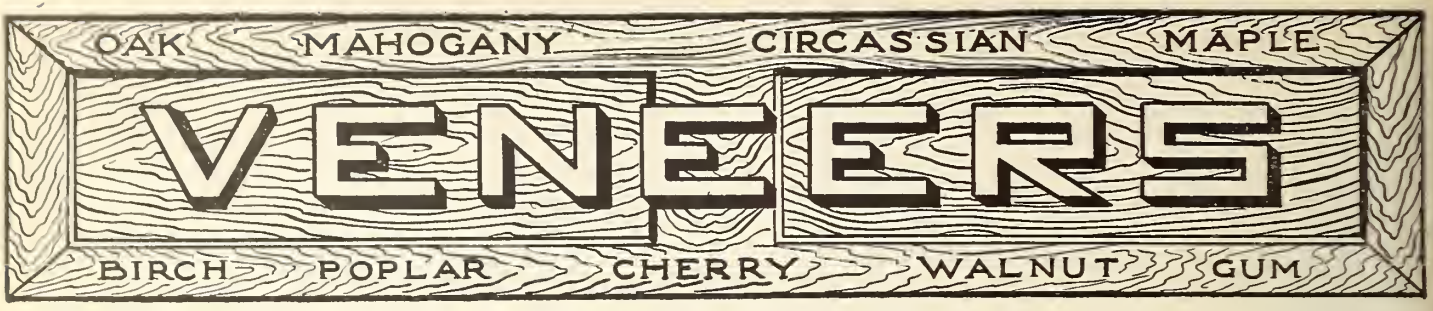
Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.

MEMPHIS, TENN.



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

May we know your requirements early?

Penrod Walnut and Veneer Co.

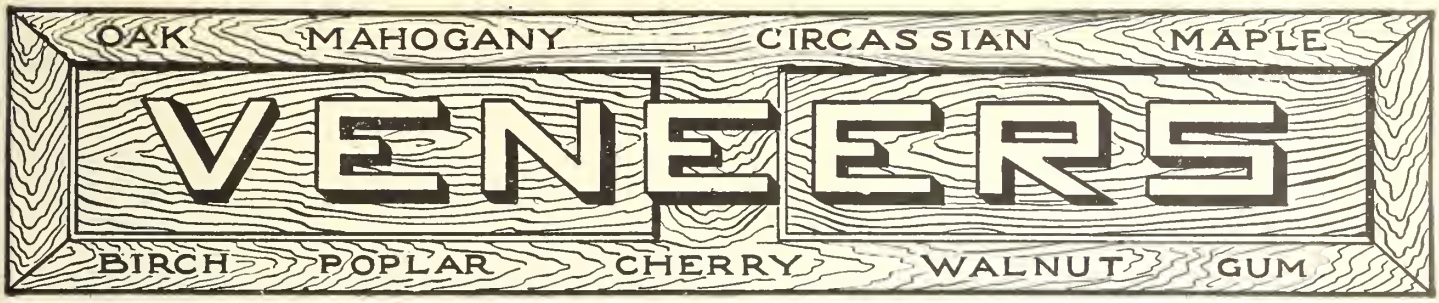
KANSAS CITY, MO.

Branch Sales Office in charge of George C. Hall, 610 South Michigan Blvd., Chicago, Ill.

Branch Sales Office in charge of W. R. Thompson, 318 Mead Building Rockford, Illinois

Branch Sales Office in charge of C. A. Rugg, 110 West Second St., Jamestown, N.Y.

Branch Sales Office in charge of E. V. Williams, 1219 Harrison Ave., Cincinnati, Ohio.



"Established 1884"

GUELPH PATENT CASK CO. Ltd.

Scotstown, Que.

QUALITY *SERVICE*

Our Veneers and Plywood are choice and we are fully equipped to supply the Canadian Trade.

Rotary cut Textile dried

We specialize in 1/4" and 3/16" three ply Birch Panels

Ontario Representative:

Frank Moss P. O. Box 356, Toronto

BUYERS OF VENEERS AND PANELS

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in this publication. They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend his time and money to get in touch with you. He deserves it—if his stock and prices are right.

Veneer Manufacturers Company

In Our Chicago Warehouse Ready for Prompt Shipment

Rotary Cut Veneers

- Ash
- Birch
- Elm
- Gum
- Red Gum
- Oak
- Pine
- Poplar
- Fig. Walnut

Figured Woods

- African Mahogany
- Mexican Mahogany
- Cherry African Mahogany
- Sliced Fig. Walnut
- Circassian Walnut
- Qtd Fig. Gum
- Qt Sawed Oak
- Qt Sliced Oak
- Sawed Vermillion

Samples of Figured Woods Sent Upon Request.

Are You Watching Our Price Stock Lists?

1036 W. 37th. St. Chicago, U.S.A.

In our New York Sample-Rooms, which are typical of the Sale Branches From a snap shot by R.W.W.

Quality Veneers

in

WALNUT BUTTS
MAHOGANY
LONG WALNUT
BURLS · OAK · POP-
LAR & OTHER WOODS

THE WILLIAMSON VENEER CO.

MILLS - BALTIMORE, MD.

Sales Branches: NEW YORK (709 SIXTH AVENUE) CHICAGO (28 E. JACKSON BOULEVARD) HIGH POINT, N.C., JAMESTOWN, N.Y.

VIEWS OF OUR PLANT No. 11. H.G.W.T.

Black Walnut Lumber—

We offer the following

Band Sawn, Uniformily Steamed

Ready for Immediate Shipment

100,000 ft. 4/4 in.—1s and 2s
75,000 ft. 5/4 in.—1s and 2s
75,000 ft. 6/4 in.—1s and 2s
100,000 ft. 8/4 in.—1s and 2s
30,000 ft. 10/4 in.—1s and 2s
100,000 ft. 4/4 in.—Selects
50,000 ft. 5/4 in.—Selects
50,000 ft. 8/4 in.—Selects
100,000 ft. 4/4 in.—No. 1 Com.
25,000 ft. 5/4 in.—No. 1 Com.

Unexcelled Facilities for Kiln-Drying

WOOD-MOSAIC COMPANY

INCORPORATED

LOUISVILLE, KENTUCKY

Methods for Making the Adhesive Strength Test of Glue

(Continued from page 82)

tory, and by taking the average of several breaks, the test becomes entirely practicable.

An additional strength test is made upon glues that are intended for plywood manufacture. The form used is the one adopted by the British and American governments for the testing of aircraft plywood. It is shown in figure 4. A piece of the plywood 3¼ inches long by 1 inch wide is sawn so that the inner section is cut through from opposite sides leaving a section of one square inch. This is then placed in a machine, as shown, designed for testing cement, but provided with special grips. The section is subjected to tension and fails principally from shearing.

Wilmers' method.—As an illustration of the way in which the strength test may be employed by any glue-shop foreman, and as an example of the more "advanced" of the modern glue-shop methods, may be cited the suggestion of Welmers. He glues two pieces of wood together measuring 1 by 8 inches, edge to edge so that a right angle is formed. One of the arms of this angle is fastened vertically into a rack on the wall, while a beam is secured to the horizontal arm. At the end of the beam is hung a pail into which water is allowed to run evenly and slowly. The weight of the pail with its contents at the breaking point of the joint is the measure of the glue strength. Such tests as this are, of course, crude, but if made with proper care some indication of the relative strength should be obtained. It is at least a beginning, and if glue consumers realized the advantages of such tests, it would not be long before a more standard and a more accurate procedure would be generally adopted.

Heinemann's method.—A different type of adhesive test has been used by Heinemann. He suggests that a determination of the minimum strength of a glue solution that exhibits a definite adhesive power on paper be taken as a measure of glue strength. Strips of strong smooth paper were used; one brushed over with, say, 1 per cent glue solution, another strip of paper laid over the first, and pressed under a 5 pound weight for 1 or 2 minutes. The paper is then taken up, and it is observed if the joint will support a weight. Heinemann found that at or about the critical degree of dilution the joint will either support a fairly heavy weight—even as much as 30 pounds—or scarcely no weight at all. All measurements are referred to a standard for evaluation.

Other methods.—Settenberg soaked strips of unsized paper in a solution of glue of definite concentration, pressed the strips between blotting papers to remove the excess of glue, and when dry broke them in a paper testing machine by tearing tests.

Weidenbusch prepared exactly equal prismatic rods of gypsum 9.2 cm. long with the sides of the transverse section 4 mm. and having a weight of 1.7 grams. These were dipped in a glue solution for five minutes, then removed and allowed to dry. The rod is then placed across an iron ring, as shown in figure 5, and a dish hung to the center of the rod into which weights are placed until the rod breaks. Weidenbusch claims to have obtained fairly consistent results by this means, but Gill has found such methods unsatisfactory.

Hauseman first employed blocks of "biscuit-ware" stone which he glued together and subsequently pulled apart. Not obtaining satisfactory results by this means he next used pieces of straight grained walnut 9 x 2 x 3/8 inches in size. These strips were glued so that 4 square inches of surface was in contact, and after leaving in the clamps for 48 hours, and curing for a further 24 hour period, they were sheared apart.

Lumber Air Dried by a Revolving Machine

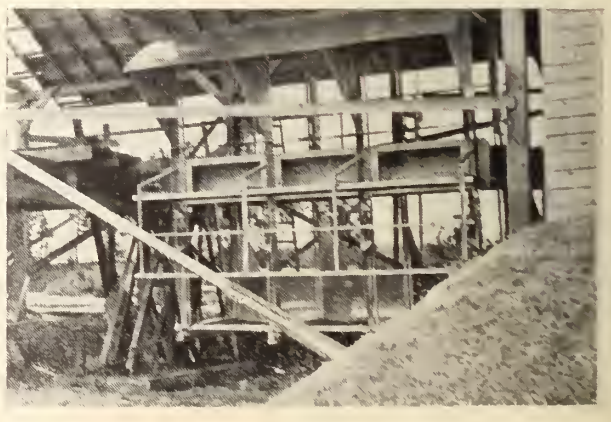
The Method Consists of Spinning the Stock at Eighty Revolutions per Minute—Suction Opens Cells of the Wood and Removes Moisture

A new process for the natural drying of lumber by means of a centrifugally operated machine has recently come to the front in Canada. The standard type of machine which revolves on a six-inch steel shaft, accommodates 4,000 feet b.m. at one loading, but larger ones can be furnished if desired. The time required for loading spinning and unloading the lumber is two hours. The production, operation and capacity of this patented invention is described by a correspondent of the "Canadian Woodworker" who recently paid a visit to the scene of its activity as follows:—

This machine was constructed and installed at a sawmill north of Sault Ste. Marie, Ont. I visited the plant and spent ten days there during which time the machine and process were thoroughly tried out.

In the morning we had green logs of birch and pine hauled out of the lake where they had been for several weeks. They were cut up in the mill and in the afternoon the lumber was spun on the machine, then removed from it and allowed to stand in the open for one week. The result was that the lumber was reduced in weight 34% from the green log, or as against the dry lumber 52% of moisture was removed.

The principle of the operation is so far as can be ascertained as follows:—The 6-inch steel shaft has a steel framework on the upper and lower side, each ca-



The centrifugally operated machine for air-drying lumber

C. L. WILLEY COMPANY

The Largest Veneer Plant in the World

FROM your viewpoint, the value of the WILLEY plant lies not alone in the quantity and quality of Veneer at your disposal, through the great variety and rarity of these treasures of the world's forests which we possess, but also, and especially, in the trained judgment and thoughtful consideration with which we select the most perfect specimens for your particular purpose.

A vast stock, and a world-wide organization constantly replenishing it, enable us to fill your orders with gratifying promptness.

Veneer & Lumber

American and Circassian
Walnut
Mahogany
Quartered Oak
English Oak
Satinwood
Vermilion
Teak
Rosewood
And Many Other Foreign and Domestic Woods

(1884)

Living Marble

THE resemblance between the grain of beautiful veneer and the veining in beautiful marble lies deeper than a mere chance arrangement of lines. The slow, orderly deposit of matter by blind forces of nature, in response to unchanging law, produced them both.

But marble is lifeless—while wood is a product of life-forces, an unfolding of protoplasm, a growth from within. Therefore we choose elegantly veined marble for a monument or a tomb, but enrich and soften the dwellings of living people with the gracious penciled lines of forest growth, made visible and enduring as Veneer.

For the selection of figures and wood best fitted for the particular work you have in hand, the WILLEY plant affords unexcelled opportunities.

Ask us for samples.

C. L. WILLEY COMPANY

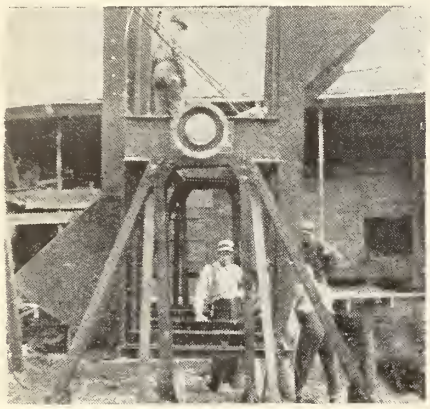
2558 South Robey Street
CHICAGO

W. T. MOORE
Sales Representative
for Michigan
110 Pearl Street,
Grand Rapids, Mich.

W. B. VAN
Eastern
Sales Representative
Everett Hotel,
Jamestown, N.Y.

pable of holding 2,000 feet b.m., (standard machine), or a total of 4,000 feet b.m. The lumber is piled from the sorting table on to a buggy or truck with the usual 1-inch stripping and with 2,000 feet is run into the upper frame of the machine, which is securely locked in, then turned over and a similar truck load is placed in the lower or other half of the machine. This is also locked in and power turned on to revolve the outfit.

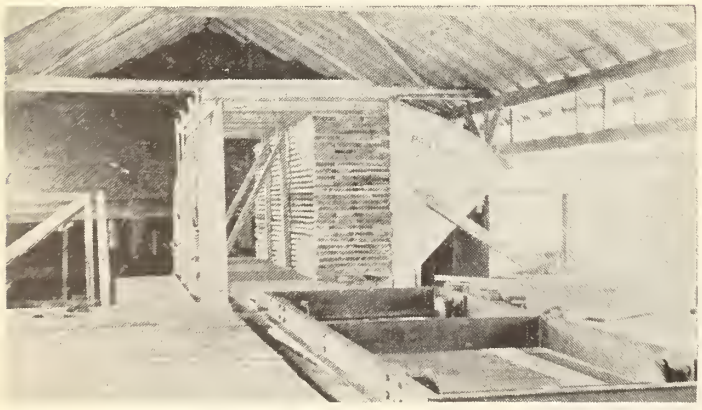
The machine is revolved at the rate of 80 revolutions per minute. The intakes are so adjusted that the air goes in at the rate of 40 miles an hour, creates a vacuum and comes out with a pull of 80 miles an



End view of the machine showing air intake wings

hour (by actual test). This intense pull or suction apparently opens the cells of the wood and sets up a syphoning action and once this action is set up, the trucks are taken out and side-tracked and the lumber allowed to stand, the moisture continuing to come out until at the end of the week it shows the difference in weight as that already cited. The lumber shows no signs of checking or warping and some of the birch was recently made into a table top for a leading furniture manufacturer with excellent results, and this without having to resort to a dry kiln.

The power necessary to operate the machine is 8



Section of the air-drying machine partially loaded and in the foreground a truck ready for loading

to 10 h.p. The other agent is the free air, no heat being required.

The 4,000 feet b.m. machine can be loaded five times per ten-hour day, thus giving 20,000 feet b.m. at the end of one week and that quantity of dry lumber daily thereafter during the operation of drying plant. About 3,000 or 4,000 baseball bats were dried out and manufactured during the winter with the thermometer at 30 deg. below zero. The wood turner who made them, has been at the wood turning business for thirty-five years and stated, when he saw logs frozen solid, hauled into the mill, cut up, put through the machine and at the end of the week given to him to turn into bats, as dry as any wood he ever handled, that he was astounded. Those were all made of birch and ash and at the present time show no signs of check or twist. Some of these bats were placed in a dry kiln for four days at 150 deg. and came out intact.

A charter has just been granted to the Natural Air Dryers Corporation, Limited, Toronto, who are already placing some of the machines in Canada and the United States.

Production of Shellac

It is safe to say that funriture manufacturers and finishers are not as a rule very conversant with the production and peculiarities of shellac which is one of the most essential materials employed in their finishing departments. Shellac is a derivation of lac, which is a resinous incrustation produced on certain trees in India, Indo-China and Siam by the lac insect. The incrusted twigs are known as stick lac. When crushed this lac becomes seed lac or grain lac, so-called because of its resemblance to seeds or grain. Melted and dried in shell-like flakes it becomes shellac. When formed into the round flat shape of a button or the elongated oval shape of a tongue, the lac is known respectively as button lac and tongue lac. These two forms, though they can be made from any grade of stick lac, are usually made from medium to good grades. Garnet lac, another form in which lac is marketed, is dark red melted into a thin slab form but not reduced to flakes.

Practically all the lac comes from British India, which furnishes about 41,800,000 lbs. against 1,400,000 lbs. exported by Indo-China and Siam. India's figure is even more predominant than these figures indicate, however, because much of the lac exported from Indo-China and Siam is stick lac while that from India is mostly clean lac rosin in the form of shellac, button lac or seed lac. In the last three years shellac has comprised on the average 89% of the lac exported from India.

Shellac has a very wide application in many lines of industry, but, of course, the use in which the furniture trade is interested is as a preservative coating for wood and metal in the form of vanrishes and lacquers. For use as a varnish, shellac is dissolved either in alcohol or by the use of an alkali in water. Denatured and wood alcohol are commonly used, but for special purposes the more extensive grain alcohol may be used. Shellac is insoluble in turpentine and linseed oil and hence is valuable for first coating woodwork, as it seals the surface, closing the pores and soft grain so that an even surface is obtained over which the top coatings can be applied with an assurance of permanence and evenness.

Shellac is graded according to its lightness of color and freedom from dirt and insoluble matter. About half of the shellac manufactured is of the grade known as "T.N.," an abbreviation for "truly native." Though of comparatively low quality and of rather dark color, it has a large consumption where cheapness is more essental than light color. This grade is usually manufactured with a mixture of rosin. Adulterations to shellac have to be guarded against, as, especially in times of high prices, considerable quantities of rosin and occasionally sugar are added.

EVERYTHING IN SOUTHERN AND CANADIAN HARDWOODS

Oak
Walnut
Poplar

Chestnut
Gum
Canadian
Hardwoods

We are getting cars for loading at Louisville, hence you can be assured of prompt delivery—Mixed carloads of any number of items without additional cost.

Try our "Hot Shot" delivery from Toronto—Stock and price list furnished on request—Get one—you'll be agreeably surprised at our fair prices.

OUR SPECIALTY—INDIANA FORKED-LEAF WHITE OAK.

TORONTO HARDWOOD LUMBER COMPANY LIMITED

Head Office:
1100-1104 Queen St. W., TORONTO. Phone Park, 6980
Yard: Atlantic & Hanna Aves. Grand Trunk Ry. Toronto.

Montreal Office:
424 Power Bldg. Phone Main 8725
Saw-mill: Louisville, Ky.

PANELS LIMITED

SOUTHAMPTON : : ONTARIO

Case Goods, Flush Veneer Doors, 3 and 5 Ply Panels, Tops, 3 and 4 Ply Table Rims, 5 Ply Rim Bound Table Tops

FOR IMMEDIATE SHIPMENT:

Stock Panels in Mahogany, Walnut, Oak, Birch, etc.
Sizes: 24 x 60, 24 x 72, 30 x 60, 30 x 72

Recognition of the high quality of our products is found in their use by leading companies for their finest creations. The continuance of this high standard is guaranteed by all the resources at our command.

Selling Agents—TORONTO VENEER CO., LTD.
1100-1104 QUEEN STREET WEST, TORONTO, ONT.

The Lumber Market

Domestic Woods

The hardwood market continues fairly active with an increasing number of inquiries and firm prices. There have been some advances, particularly on firsts and seconds and No. 1 Common in chestnut, and firsts and seconds in plain and red oak; otherwise quotations remain very much the same as they have been for some weeks past. There is a strong demand for maple and birch is also having a good call. The principal shipment of these woods is to Detroit ,Buffalo and other United States points.

Some complaints have been heard with reference to the car shortage, particularly in the East. The Transportation Committee of the Canadian Lumbermen's Association is taking up the matter and hopes to report an improvement in conditions in the near future. The secretary of the Railway Association of Canada says there are 19,000 box cars on United States lines in excess of the United States cars on Canadian lines. This is 9000 more than usual, due to the fact that American cars were held up by the strike of railway shop employees and the big demand for rolling stock for hauling coal. The American railways will not return Canadian cars if it can be avoided. On the other hand, complaints are made in Quebec that Canadian cars are not unloaded promptly, and it is alleged this fault rests with the railways themselves. It is expected, however, that from this on there will be a gradual improvement in the situation. This particularly affects a number of Canadian wholesalers who have not been able to secure deliveries of southern hardwoods, orders for which were placed many weeks ago.

There is an improvement in a number of the woodworking industries. Door and hardwood flooring plants are particularly busy; in fact a number of these establishments have sufficient orders on hand to keep them going for the next six or eight weeks.

Hardwood lumber producers still complain that the low ends are not finding a ready market and that prices are altogether too low. One Northern Ontario firm says that no operator can find his stumpage, log it properly, mill the product, handle it several times, pay insurance, keep his plant up and remain on speaking terms with his banker at the low value which No. 3 common in birch and maple is sold at to-day. "It must be remembered," he points out, "that there is no over-cut in hardwood. Latent defects prevent it. It often happens that a very fine log after the slab is off will develop a defect running through half the length of it. Maple, perhaps, more than any other wood, covers up wounds received at different times in its growth. The producer of hardwood lumber should receive, at least, double the price, it is contended, that the softwood manufacturer secures, for he handles two tons to the other's one. He gets no over-cut, recovers a very small percentage of high-class lumber and is offered for his class a figure that does not pay the saw bill. "And," concluded the speaker, while consumers may be looking for cheaper lumber, it cannot be hardwood. On the contrary there must be an increase in the price of hardwood if the manufacturer is to receive even a small profit, and he is entitled to that."

There appears to be a feeling that lumber in certain grades will be scarce by next spring if the demand is at all normal as seems possible that it will be. This, of course, would mean higher prices, and no one wants to see a runaway market. The stabilization of values and production is the desideratum of all branches of the trade at this particular period.

Imported Woods

Reports from all the hardwood centres of the United States seem to indicate that business is on a better plane than it has been for some time. Orders seem to be extremely plentiful, inquiries are numerous and distribution is taking place as fast as cars can be obtained; in fact it was reported that it is doubtful if there ever was a fall season in the history of the business when trade was so active as this fall. In place of the retail demand falling off, it seems to be increasing and the only fly in the ointment is the car situation. This car scarcity is interfering with shipments, of course, and distributors report orders that cannot be filled. The volume of new construction in the United States continues very heavy and as a consequence lumber is in demand. Furniture factories, too, seem confident that they will have a big winter business. This is partly due, of course, to the vast amount of residential and apartment house construction. Box makers as a rule report a notable increase in their activities, indicating a general speeding up of industry all along the line. The piano and phonograph trade is somewhat slackening, due to the season, but automobile companies are hard at work on closed jobs for winter sales and as a consequence there is considerable lumber for this purpose in demand. Reports from three of the leading centres are as follows:-

Memphis, Tenn.—Transportation facilities are governing the hardwood situation at this point. There appears to be plenty of demand with orders coming in in great numbers. The only difficulty is that consumers are urging prompt shipment and there is difficulty in handling them owing to the lack of suitable transportation equipment. It is stated that inquiries and orders are now larger than they have been for more than two years and that the industry is on the eve of a tremendous revival, as soon as it is possible to make shipments on a larger scale. Furniture, automobile and flooring manufacturers are very active in the market while other lines seem to be requiring large amounts of lumber.

Louisville, Ky.—Louisville hardwood producers claim that they would be doing a fine business if the car situation were normal. The demand for all kinds of lumber and veneers is exceptionally good, all lines of the wood-using industry being in the market. Prices are somewhat advanced due to the fact that movement from the far-distant producing centres is slow and stocks on hand are commanding a premium.

Evansville, Ind.—In spite of the car shortage the hardwood lumber manufacturers in this vicinity report a somewhat increased demand and they are looking for a splendid business for the balance of the year. Prices are holding firm. In this section of the country it is stated that there is some improvement in the car shortage situation. All branches of the wood-working industry are in the market but ash, poplar, white oak and gum are the woods that are in most demand. If cars are available, most of the manufacturers are expecting a big winter business.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

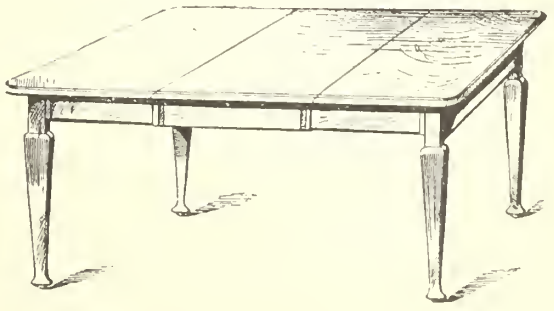
VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

GOOD Plywood is only produced by using first class materials; properly constructed, by careful and skilled workmen.

Our panels are made in this way. Panels in Maple, Birch, Plain Oak, Qrt. Oak, Walnut, Mahogany, Gum, etc., in standard sizes or made to order in quantities.

Flush Veneered Doors in B.C. Fir, Georgia Pine, Plain Oak, Qrt. Oak, etc.



Write for catalogue and prices.

HAY & CO., Limited Woodstock, Ont.

News of the Trade

The Anglo-Canadian Company, Iberville, P. Q., are contemplating building a two-storey factory to cost $5,000.

Security Box Co., Montreal, was registered recently with Harry Lehman as principal.

National Auto Body Co., was recently registered at Montreal.

The Gotfredson-Joyce Corporation, Ltd., Walkerville, Ont., have started excavating for a $20,000 addition to their factory.

The Sturgis Baby Carriage Co., Sumach St., Toronto, have postponed the erection of their new factory at Brampton, Ont., until next spring.

The Woodstock Pipe Organ Builders, Ltd., lately installed a $12,000 organ in the Simpson Avenue Methodist Church, Toronto.

James Brookes Woodworking Co., New Westminster, B. C., was recently awarded the millwork contract for the new Canadian Memorial Church at Vancouver, to cost $55,000.

The Seaman, Kent Co. are erecting at Meaford ,Ont., a large concrete building for housing sawdust. The structure is 35 x 40 feet and 29 feet high.

Parlor Furniture Manufacturers, Ltd., Victoria St., Point aux Trembles, P. Q., was damaged by fire recently to the extent of $75,000.

Pembroke Plywood Co., Pembroke, Ont., have leased the old Pembroke Iron Works buildings and are installing machinery to manufacture veneer and plywood.

A. W. Carmichael, Limited, Toronto, is a new company incorporated with provincial charter to manufacture and deal in all kinds of building supplies. Capital $250,000.

Daniel Sinclair, of the Sinclair Carriage Works, Lindsay, Ont., was drowned recently when returning to town from his summer home in a motor boat.

Royal Brush Company, Hamilton, Ont., was recently granted a provincial charter to manufacture and market brushes, brooms, felt wheels and other similar articles. Capital $40,000.

Mr. L. Yarwood, manager of the Canada Toy & Novelty Manufacturing Co., Smith's Falls, Ont., spent a few days recently in Toronto on business in connection with the sale of the products of the company.

A. L. Reid Co., Ltd., Toronto, were recently incorporated to conduct a business as dealers in builders' supplies. Capital $40,000. A. L. Reid and P. W. Ninnes, both of Toronto, are two of the incorporators.

J. Lemages, Terrebonne, P. Q., was awarded the millwork contract recently for the new 32-suite apartment house at Outremont, P. Q., which will cost $200 000. The lumber contract was given to L. Villeneuve & Co., Outremont.

Thomas Hayes died recently at his home in Champlain St., Quebec City, in his 83rd year. The late Mr. Hayes was an expert ship's carpenter and was much sought after to build racing shells for sculling matches on the St. Lawrence River.

A very successful Made-in-Owen Sound Exhibition was held in that city. Interesting and attractive displays were made by the Keenan Woodenware Mfg. Co., Limited, and the Eureka Refrigerator Co. Both these firms occupied considerable space and their showing was a creditable one.

W. J. Currie, president of the Curric Manufacturing, Brandon, Man., suffered a painful accident on August 31. He was running some boards through a machine in the factory when his hand was caught and four fingers practically amputated.

The warehouse of the Keenan Woodenware Mfg. Co., at Owen Sound, Ont., was burned to the ground recently and was a total loss. It was well stocked with everything that the firm manufactures and the loss is all the more keenly felt as it occurred at the company's busiest season.

Dominion Upholstery Co., Ltd., Ottawa, is a new concern incorporated with a capital of $40,000 to maufacture and deal in all kinds of upholstery goods. M. Agulnick and H. Orkin, upholsterers, both of Ottawa, are two of the incorporators.

Natural Air Driers Corporation, Ltd., Sault Ste. Marie, Ont., were recently granted a federal charter with a capital of $200,000, to manufacture and market drying and seasoning equipment. J. M. Sinclair, manufacturer, Toronto, and W. H. Edwards, merchant, Sault Ste. Marie, are two of the incorporators.

William S. Johnson, Silver Birch Ave., Toronto, one of the original members of the Massey-Harris Company, died recently in his 71st year. When the late Mr. Johnston retired some fifteen years ago, he was general superintendent of the concern which he had seen grow from a small workshop at Newcastle, Ont.

Mr. A. E. Simmington, of Toronto, who is well known to the woodworking trade, having been connected with Scholey Bros. for 19 years, recently opened a factory at the rear of 471 King St. E., Toronto, and will manufacture spools and wood products, band saw shaping, moulding and general millwork.

The Glen Falls, N. B., factory of Clarke Brothers and Company, Limited, which concern operates a pulp and paper mill and saw mill at Bear River, N. S., also, has not been operated of late. Reopening may take place in the late fall when a satisfactory adjustment of the financial affairs of this concern may be arranged.

Merkley & Menzies, who for some years conducted a retail lumber yard and planing mill in Milton, Ont., recently dissolved partnership, Mr. Merkley having bought out the interest of his partner, D. Menzies. Mr. Merkley is well known in the lumber industry, having operated the plant for a long time as manager previous to becoming proprietor. Business during the past season has been very good in the lumber line in Milton.

The H. J. St. Clair Co., Ltd., well known manufacturers of complete store fronts, of Toronto, have recently opened a new factory at 28 Eastern Ave., Toronto. They have recently installed new machinery and are amply equipped to handle the biggest contracts in this line. They have just completed a big job for the L. R. Steel Company, at Hamilton.

The Owen Sound Stave and Shook Mills is one of the more recently organized companies. A little over a year ago Messrs. Norman Bumstead and J. H. Theaker organized the company which is located on 3rd Ave. W., in the old Grey and Bruce cement plant. The firm manufacturers a good line of barrels, kegs, etc. Right now a truck is on the road delivering apple barrels for the apple crop. The company's business is on the increase, and it should develop into an important industry.

In connection with the centennial of the town of Bridgetown, N. S., it is appropriate to refer to J. H. Hicks & Sons, widely known woodworkers. The company is not, perhaps, the oldest in Bridgetown, but is more closely associated historically than any other company doing business there. The present John Hicks, founder of the business,

Uniform Lumber Means Greatest Satisfaction To The User!

You no doubt have experienced the expense, loss of time, and loss of materials, caused by the use of improperly cured, wrongly graded, and carelessly handled hardwood.

Kraetzer-Cured Lumber is absolutely uniform in quality, properly graded, and every board plainly marked, showing the grade. To show our faith in Kraetzer-Cured products, every board is stamped with our brand.

THE KRAETZER-CURED LUMBER CO.

Because of our unusual facilities we control the lumber from the virgin growth to the time it is loaded on the cars and shipped to you.

When you have once used Kraetzer-Cured Lumber you will not be satisfied with the ordinary kind. Read the eight important reasons why Kraetzer-Cured Gum is used by thousands with such satisfactory results. It will give the same results to you.

Kraetzer-Cured Lumber is of the very best quality, carefully handled by all departments. Every step in this process is taken with the idea of producing uniform high grade hardwood that w ill give maximum service in your hands.

In addition to Kraetzer-Cured Gum, we can furnish Oak, Ash and other Southern Hardwoods.

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorehead, Miss. Leflore, Miss.

You Should Use KRAETZER-CURED GUMWOOD *Because:-*

1. It is STRAIGHT and FLAT, free from the warp and twist usually encountered in untreated stock.
2. It is BRIGHT and will satisfactorily take any finish.
3. It is free from dote or rot—the sap and gums are eliminated by the steaming process, and fermentation and decomposition are thus prevented.
4. Through the elimination of stain and decomposition, it possesses greater strength and longer life.
5. It contains only atmospheric moisture, enabling it to be used for many purposes without kiln drying.
6. When kiln drying is necessary, this can be done in much less time and with more satisfactory results.
7. It is uniform and dependable. One car like another, grade and measurement what it should be—no time w a s t e d in reporting complaints or shortages, no delays or interference with factory schedules because of holding lumber for adjustments.
8. It is the most economical lumber available. It will satisfactorily answer any requirements expected of materially higher priced woods. Join our little army of satisfied users, and just as peace is about to supplant war, let peace of mind take the place of the warfare and worries that usually beset the user of lumber.

We're proud of this product —that's why.

follows in direct line from the first John Hicks who settled there in 1763. The firm started in a very modest way thirty years ago, growing steadily each year until now they employ over one hundred men. Mr. John Hicks says they have experienced a very active year in their business.

Walsh Bros. operating a woodworking plant in Chatham, N. B., have been doing good business through the summer and early fall despite the general depression in the lumber trade. This concern has been established in Chatham for many years and manufactures doors, sheathing, windows, etc. It is one of the well known industries of the North Shore of New Brunswick.

Montreal capital is said to be interested in a project for the building of a woodworking plant at Woodstock, N. B. A site has been inspected and it is said construction will start in the spring. It was originally planned to build the factory in the early fall of this year but this intention was abandoned in the hope that prices of building materials and labor would drop next spring.

The Kentville Woodworkers, Limited, Kentville, N. S., have been shipping from their factory through to points in different sections of the Maritime Provinces casings, door jambs, sheathing, doors, etc. This firm has been busy all through the summer, and there is the expectation of continued good business all through the fall and winter. Although most of the firm's trade is through the Annapolis Valley, there are calls from other sections.

With the advent of the hydro-electric current in St. John, N. B., from the station on the Musquash River at Musquash, it is expected that woodworking factories in lower New Brunswick can be operated at one-half the present cost of power. Woodworking manufacturers are watching with much interest the present battle between the New Brunswick Power Company and the United Organizations of St. John on the question of private and municipal distribution of the current.

The Victor Woodworking Company, Limited, with factory at Amherst, N. S., are busy in their plant on orders for doors from Moncton and Amherst. This company has succeeded in securing much business from Prince Edward Island, shipments being made over the Tormentine branch of the C. N. R. to Cape Tormentine and thence by ferry across the Northumberland strait to Point Borden.

The woodworking factory of Murray and Gregory Ltd., St. John, N. B., which concern also operates a saw mill and art glass plant in connection, has been busy since spring. This woodworking factory is not so evident to the people of St. John as the other woodworking industries owing to its situation near the Reversible Falls. And yet the Murray and Gregory woodworking plant has been an active industry for many years. The leading spirit in this firm is J. Fraser Gregory of St. John. He has been one of the most prominent lumbermen in New Brunswick for many years. Mr. Gregory spent part of the spring and summer in Europe with his wife.

Christie Brothers, Limited, St. John, N. B., operating one of the oldest and busiest woodworking plants in the Maritime Provinces have the happy faculty of retaining in their employ men who have spent decades at their plant on Erin Street, and the former plant on City Road. One of their employees, Hugh Beck, has been a worker for Christie Bros., Limited, for more than twenty-five years.

A Made-in-Owen Sound Exhibition was recently held in that city and was very successful from every point of view. The wood-using industries were well represented, among them being the Keenan Woodenware Manufacturing Co., whose exhibit is shown in the adjoining illustration.

ONTARIO HANDLE CO.
411 Manning Chambers
TORONTO
Manufacturers of
BROOM and BRUSH HANDLES
DOWELS and BRUSH BACKS
and SMALL TURNINGS

The Sidman Lumber Curing Process

IN

Remodeled or new, Wood, Brick or **Concrete** Buildings.

Fillers and glazes to preserve the building.

The TAG-ROESCH **Automatic** Time-Temperature and **Humidity Controller.**

Three-ply and Du-o-fold Army Duck Curtains, and Hussey Door Carrier Doors.

Automatic Heating, Ventilating and Humidity Systems for Varnish Rooms.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Sidmans AUTOMATIC **Suction System** for returning ALL Condensation DIRECT to the Boiler.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-Down Draught Vent Heads for all purposes.

Cleanable Screen Panel and Window Ventilators.

Roller Bearing (Ott) **Channel Iron** Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and The Sidman Special Hygrometers.

For Description and prices, write

The

Sidmans of Canada

Heating and Ventilating Engineers and Lumber Curing Specialists

LONDON ONTARIO

THE C S M L.C.K A S Reg Trade Mark

"A few cars picked at random from our

Dry Hardwoods

1	Car	5/4" No. 1 Com. & Btr. Basswood.
1	"	5/4" No. 2 & 3 Com. Basswood.
½	"	10/4" No. 1 Com. & Btr. Birch.
½	"	12/4" No. 1 Com. & Btr. Birch.
2	"	8/4" No. 2 Com. & Btr. Soft Maple.
2	"	8/4" No. 2 Com. & Btr. White Oak.

If interested let us know

We invite your inquiries for anything in

Canadian Hardwoods

Our line is quite complete"

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 514 Canada Cement Co., Bldg.

Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

The Bankruptcy Act

Estate of P. Brocklebank, Cornwall, Ont.

Sealed tenders addressed to the undersigned and endorsed "Tender for Planing Mill or Sash and Door factory," will be received at this office until noon **on the 15th day of November 1922,** for the purchase of the Planing Mill and Sash and Door Factory of the above situate in Cornwall, Ontario. Alternative tenders will be received for the purchase of:

"A" The Land, Buildings, Plant and Machinery etc., en bloc as a going concern.
"B" Land and Buildings only.
"C" Plant and Machinery only.

The Factory is still operating and is fully equipped with all modern machinery driven by Electric Motors of 66 Horse Power. There is a Railway Siding to the Plant served by the Grand Trunk, Canadian Pacific, and New York Central Railways.

The approximate book value of the Land and Buildings is $7,000.00 and of the Plant, Machinery, etc. $18,000.00. The highest or any tender will not necessarily be accepted.

Full particulars and description of the above can be obtained from the undersigned Trustee.

JAMES M. JOHNSTON,
Authorized Trustee,
10 Pitt Street, Cornwall, Ontario.

For Sale or Exchange

$1,500.00 MacGregor Gourley 6 x 15 matcher will exchange for lumber. George Rathbone, Ltd., Northcote Ave., Toronto. 10

Business Opportunity

Grand opportunity to acquire an interest and position in old established show case and store fixture manufacturing business in Toronto. Must understand the line thoroughly. Reply Box 146, Canadian Woodworker, Toronto. 10

Machinery for Sale

1–16"	Buzz Planer (C.M.G.).
1	Chain Mortizer (New Britton).
	Circulator Saw Grinder (Hart Cor.).
3	Head, Hayes sticker 6".
1–30"	Planer knife grinder (Hart Cor.).
1–20"	Drill.
1	Blind Slat Machine (M.C.G.).
1	Door Clamp.
1–36"	Band Saw (Ballantyne).
1	Rivetting Machine High Speed Hammer Co.
1	Chain Feed Box Board Matcher (C.M.G.).
1	Sash relisher & Mortiser (C.M.G.)
1 Ft.	Mitering Machine.
1	McGregor Gourlay Tenoning Machine.
1	Knight Jig Saw.
1–75	Horse Power Wheelock Engine.
1	Power Mortiser (McGregor & Gourlay).
1	Swing Saw (Goldie & McCullough).
1	Blind Wiring Machine (McGregor).
1	Planer & Matcher (Clarke & Deening).
1 No.	118 Inside Moulder (Berlin).
1	Veneer Press 6 section of 3 screws each (Francis).
1–4	Head sticker 6" (Greenlie).
1	Saw table (Jackson & Cochrane & Co.).

MACHINERY EQUIPMENT & SUPPLY CO. REG'D.,
40 Queen St.,
10-12 E.o.I. Montreal.

Used Woodworking Machines

Are you looking for a used machine? Look over this list. If any of these machines interest you, don't hesitate to write for further data. It will be worth your while.

1—Band Rip Saw—42" x 3".
1—42"—3 Drum Sander, rebuilt.
1—30" Single Cabinet Surfacer, rebuilt.
1—Two spindle oscillating Sander.
1—6 Ft. Hollow Arm Sander, good as new.
1—10" Sticker.
1—48"—3 Drum Sander.
1—8" Sticker.
1—3 side Planer and Matcher—15".
1—Double End Tenoner.
1—30" Single Surfacer.
1—Yates 43" Endless Bed Sander, rebuilt.
1—6 Ft. Swing Saw.

JAMES AVERY,
1351½ Queen St., West. Toronto, Ont.
9-10

GOOD VALUES

Subject to Prior Sale

Band Resaw, Connell & Dengler, 54 and 60 inch.
Band Rip Saw, Yates No. 281.
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 30" and 44".
Dowel Machine, Clement.
Dowel Gluer and Driver, E. B. Hayes.
Jointer, Falls Machine Co. under cut 24".
Jointers, 12", 16", 24".
Jointer, Diehl, Continuous Feed.
Lathe, Back Knife, Clement 40".
Matcher, American No. 229 hardwood.
Matcher, Berlin No. 94, 15" x 6".
Moulder, Woods 10 and 12" inside.
Moulder, American 7" and 10" 4 side.
Planers, all sizes, single and double.
Sander, endless bed, 48" H. B. Smith.
Sander, Moore Machine Co. belt.
Sanders, Berlin 36", 42", 48" and 60".
Sander, Clement Belt roller table.
Saws, Berlin Double Cross Cut.
1—15 x 4—Four side McGregor Gourlay Matcher.

Woodworking Machinery Co., of Buffalo,
54 Mechanic St.,
Buffalo, N. Y.
10 T.f.

For Sale

Linderman Jointer with cut off saw. Shop Number 265 but this does not represent type of machine as has been rebuilt; is up-to-date and first class, has all attachments. Takes stock up to 72". Also Fay and Egan Band Rip-saw No. 202, First class condition. Diameter wheel 42", width of wheel 4". Tight and loose pulleys, self feeding attachment. Equipment includes swedge, side dresser, power band saw grinder, and brazing clamp. Both these machines can be bought right. Address Box 145, Canadian Woodworker, Toronto. 10-11

FOR SALE

19 H.P. Gasoline Engine, 25 H.P. Wheelock Steam Engine, Steam Chair Back Bender, 2 Spindle Borer Machine, 2 Veneer Presses, 1 Glue Spreader, Double Belt Sander, Cabinet Benches, Surface Planer, Glue Pots, 5 Ton Wagon Scale, 2 Wood Presses, 150 H.P. Boiler, 1 Sheldon Dry Kiln, Factory Trucks.

Manufacturer of Doors and Window Frames, and Dealer in Lumber, Coal, etc.

R. W. NICHOLSON,
8-T.f. Strathroy, Ont.

QUALITY SERVICE

Things are moving again

Industry is speeding up. Better get in the procession and have the goods to meet the demand.

You will need

something in Canadian Hardwoods.

Try ours

With your factory facilities and our lumber, it will be a hard combination to resist.

Kinnon Lumber Co.
LIMITED
454 King St. W. Toronto

New and Used Woodworking Machinery

We can save you money—look over our partial list and if you do not see your requirements —Write, wire or phone us.

	SHAVING EXHAUSTERS	
50"	American Blower Co., 16" Outlet	$ 75.00
48"	Foster Ball Bearing 18" Outlet	100.00
40"	Keith 15" Outlet	50.00
	MOULDERS	
7"	4 Sided Goldie McCullough	350.00
7"	3 Sided Cowan & Co.	275.00
12"	4 Sided Cowan & Co.	650.00
	SHAPERS	
2	Spindle	100.00
1	Spindle	85.00
	SANDERS	
	Pattern Maker's Disc & Drum 18"	75.00
131	Mattison Belt Sander 8' Table	350.00
	PLANERS	
24"	Major Harper Poney Planer	175.00
30"	x 12" McGregor Gourlay Double Surfacer	1250.00
24"	Buzz Planer No Fence	100.00
16"	Buzz Planer No Fence	50.00
12"	Buzz Planer Complete	100.00
	MORTISERS	
	Cant Brothers Galt	75.00
	LATHES	
12"	Pattern Maker's Iron Bed.	75.00
	SAWS	
	Trim and Rip Saw	125.00
26"	Cant Gourlay Pedestal Band Saw	100.00
42"	Jackson Cochrane Band Rip	250.00
	Famous Swing Saw with Table	100.00
	Elliott Woodworker 1-½ Wagner Motor	180.00
	Elliott Jig Saw	35.00

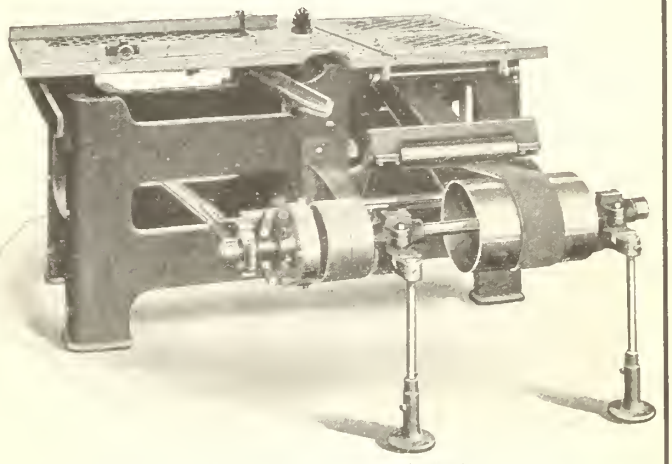
GENERAL MACHINERY CO.
67-69 Frederick St., TORONTO
TELEPHONE MAIN 2200W

The Peter Hay Knife Co., Ltd.

Manufacture the Best
PLANER KNIVES
and CUTTERS
OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited
GALT, ONTARIO

DEPENDABLE MACHINERY
For Your Wood Mill



No. 22 Large Bevel and Mitre saw

A most valuable machine in all automobile, carriage, furniture, door and woodworking factories.

Massive frame—adjustable table—saw can be raised or lowered to any angle up to 45 degrees. Perfect working in every detail.

WOOD-WORKING MACHINES

No. 19 Small Saw Tenoner. No. 20 Large Saw Tenoner.
No. 21 Regular Bevel and Mitre Saw. No. 22 Large Bevel and Mitre Saw.
No. 23 8½-in. Irregular Dresser No. 24 6-in. Irregular Dresser stock clamps

Woodworking machines equipped with direct motor or belt drive.

METAL MACHINES

Large Automatic Power Hammers (For body panels and all other metal work.) Metal Trimming Cutters. Rotary Cutters. Metal Rollers or Formers
Small Automatic Power Hammers (For body panels and all other metal work.) Power Beaders. Foot Presses.

$

Write for catalogue
PETTINGELL MACHINE CO. Amesbury, Mass.

Quick as a Cat - A Hold like a Bull Dog

Endorsed by manufacturers and manual training schools throughout U.S. and Canada.

No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

No. 430 Vise—Two Sizes with or without stop
UNEQUALLED FOR STRENGTH AND DURABILITY
Our Complete Catalogue on Request
RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.

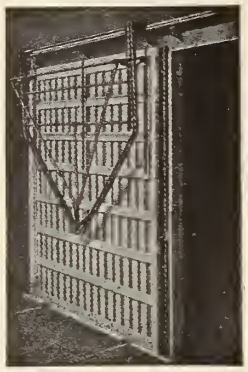
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.
Ask for catalogue.

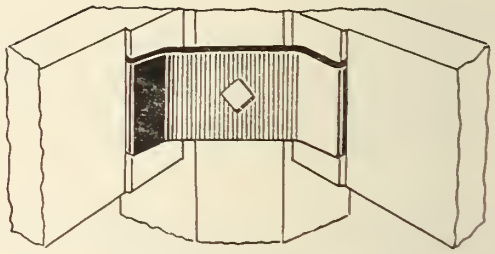
DRY KILN
DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

Kasebier Quality
Kiln Dried Bleached

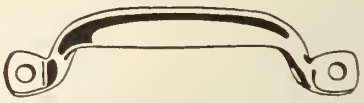
SHELLAC

"Ask the Man Who Uses it"

Kasebier-Chatfield Shellac Co.
No. 7 Cedar St., New York



No. 23 Corner Brace



No. 43 Pull

Furniture Trimmings, and Butts Special Hardware

We Also solicit your enquiry for Special Stampings

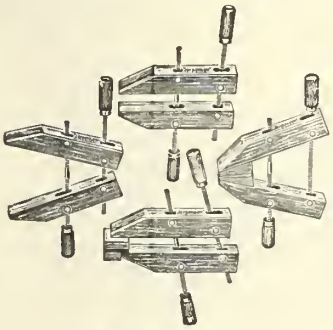
Larsen & Shaw, Limited
Walkerton, Ontario

OAKEY'S
Glass Paper, Flint Sand Paper, Garnet Paper
IN SHEETS AND ROLLS FOR ALL PURPOSES
Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide
SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers
JOHN OAKEY & SONS LTD.,
WELLINGTON EMERY AND BLACK LEAD MILLS
LONDON, S. E. 1.

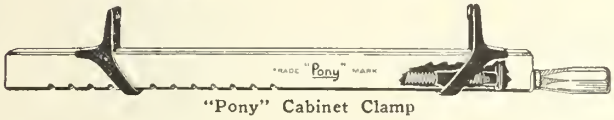
Canadian Agents:
F. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

The "JORGENSEN"
Steel Spindle Hand Clamp

10 sizes Adjustable 10 sizes Rigid Jaws



The truth is the "JORGENSEN" is not constructed down to a price but up to a standard—If you need hand screws, why not get the best, and save money, look for the name "JORGENSEN."



"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.

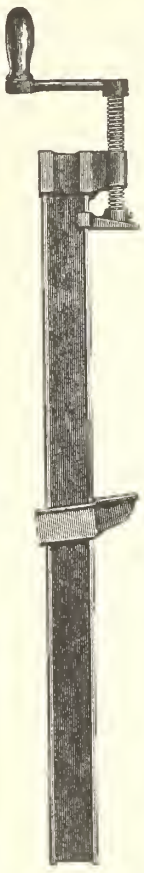
Manufactured only by the

Adjustable Clamp Company

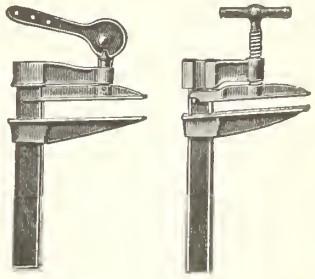
216 N. Jefferson St., Chicago, U.S.A.

For Sale By

Aikenhead Hardware Limited .....Toronto
Lewis Bros., Limited .....Montreal



Colt's Clamps
for the
Woodworker



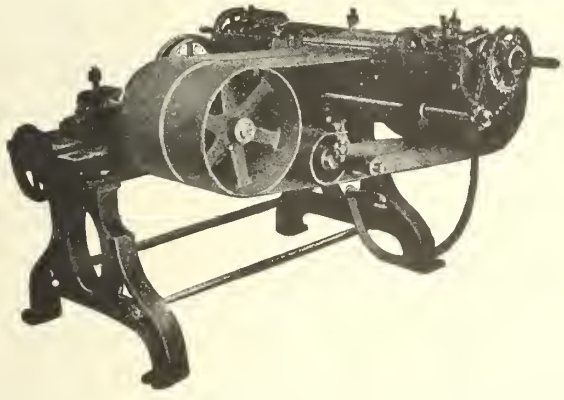
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



Give your Broom Handles a nice Smooth Finish and get Highest Prices for them. The "OBER" Automatic Sander will do the work Rapidly and Economically. We build Laths, Sanders, Rip-Saws, Bolters, chucks, Chucking Machines, etc. for making Handles of various kinds, Ball Bats, Whiffletrees, Neck Yokes, Spokes, Golf Shafts, etc.

Write for free catalogue No. 31.

The Ober Mfg. Co.

Chagrin Falls, O., U.S.A.

CLAMP NAILS DO IT

THE CASKET-MAKER

Internationally known and universally adopted by the leading manufacturers of furniture and caskets as the most practical and economical method of mitred joinery.

Samples and circulars on request.

CLAMP NAIL COMPANY

4532 Palmer St. CHICAGO, U.S.A.

The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co. Toledo, Ohio.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARING
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Co., Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B. Hamilton Ont.

BAND SAWS
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W. Toronto.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Yates Machine Co., P. B. Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P. B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner, Mass.
Williams Machinery Co., A. R. Toronto, Ont.

BEVEL & MITRE SAWS
Pettingell Machine Co. Amesbury, Mass.

BIRCH
Edward Clark & Sons, Toronto, Ont.

BLOWERS
Canadian Blower & Forge Co. Kitchener, Ont.
Sturtevant B. F. & Co., Galt, Ont.

BLOW PIPING
Canadian Blower & Forge Co. Kitchener, Ont.

BOILERS
Engineering & Machine Works, St. Catharines, Ont.

BORING MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Sons Co., L. G., Gardner, Mass.
Nash, J. M. Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. R. Hamilton, Ont.
Valley City Machine Works, Grand Rapids, Mich.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CARVINGS
Klise Mfg. Co., Grand Rapids, Mich.
Decorators Supply Co., Chicago.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

CARVED WOOD MOULDINGS
Klise Mfg. Co., Grand Rapids, Mich.

CASTERS
Foster, Merriam Co., Merriden, Conn.
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Sons Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C. Indianapolis, Ind.
Shurly-Dietrich, Galt, Ont.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Sons Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company,
Taylor Mfg. Co., Jas. L. Poughkeepsie, N.Y.

CLAMP CARRIERS
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

CRATING LUMBER
Colborn, C. B. Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D. Guelph, Ont.

CUT OFF SAWS
Atkins & Co., E. C. Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Co., of Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rochford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOORS
Pannill Door Co. Ltd., Toronto, Ont.

DOORS (Flush Veneered)
Hay & Co. Ltd., Woodstock, Ont.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.
Richard-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R. Toronto, Ont.

DOWEL MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company,
Ober Mfg. Co., Chagrin Falls, Ohio.
Preston Woodworking Machinery Co., Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
W. S. Hawker Mfg. Co., Dayton, Ohio.

DOWELS
Canada Wood Specialty Co. Ltd., Orillia, Ont.
Rowe Mfg. Co., Newago, Mich.

DRIERS (Hot Plate)
Merritt Eng. & Sales Co., Lockport, N. Y.

DRIERS (Veneer)
Merrit Eng. & Sales Co., Lockport, N. Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont.
Cutler Desk Co., Buffalo, N. Y.
Grand Rapids Veneer Works, Grand Rapids, Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

DYNAMOS
Industrial Engineering Co., Toronto, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

EDGER SAWS
Atkins & Co., E. C. Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

ENAMELS
Cosmos Chemical Co., Port Hope, Ont.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Garlock Machinery Ltd., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co., Kitchener, Ont.
Sturtevant, B. F. & Co., Galt, Ont.

FEED ROLLS
Atkins & Co., E. C. Hamilton, Ont.

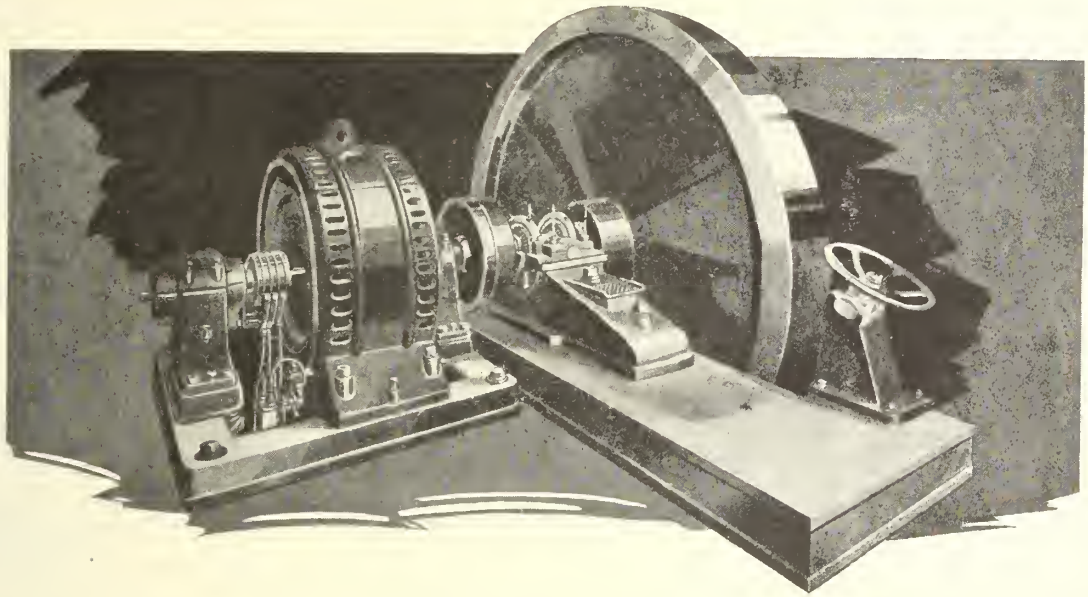
FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FIBRE PRODUCTS
Carter, E. T. Toronto, Ont.
National Patent Reed Sales Co., Philadelphia, Pa.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

FRUIT PACKAGE MACHINERY
St. Joseph Iron Works, St. Joseph, Mich.

SKF



Five Hours on its Own Momentum

—An Achievement Possible Only With Ball Bearings

Five hours of motion without power! Unbelievable—but nevertheless an actual fact, as demonstrated by this fly-wheel type alternator which revolved on its own momentum for five hours.

Four SKF marked self-aligning ball bearings are used to support the revolving parts running at 500 R.P.M. and weighing 44,000 pounds.

You can imagine then the amount of energy which the use of ball bearings, as compared with plain bearings, saves in the course of a year in any plant. Since the saving in each machine is added to that of the others, the total is no mean quantity and represents a substantial increase in plant efficiency and a worthwhile economy.

When self-aligning ball bearings are used friction is practically eliminated and marked economy effected as well in lubrication and maintenance. See that your electrical machinery is ball bearing equipped.

CANADIAN SKF COMPANY, LIMITED

Toronto - Montreal

Normal View *Deflected View*

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N. Y.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.
Dominion Appraisal Co., Toronto, Ont.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.

GLUE
Canada Glue Co., Brantford, Ont.
Cannon Canadian Co., Toronto, Ont.
Coignet Chemical Products Co., New York, N.Y.
Kane Manufacturing Co., Chicago, Ill.
Monite Waterproof Glue Co., Minneapolis, Minn.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Taylor Mfg. Co., Jas. L. Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.

GLUE ROOM EQUIPMENT
Merritt Eng. & Sales Co., Lockport, N.Y.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R. Toronto, Ont.

Grinders (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng. & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.

GROOVERS
Atkins & Co., E. C. Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Mattison Machine Works, Rochford, Ill.

GUM LUMBER
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W. Va.
Rush Lumber Co., Memphis, Tenn.
Turner-Farber-Love Lumber Co., Leland, Miss.

HAIR (Curled)
Blocksom & Co., Michigan City, Ind.

HAND SCREWS
Fay & Egan Co., J. A. Cincinnati. Ohio.

HANDLE & SPOKE MACHINERY
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rochford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.

HARDWOOD DIMENSION STOCK
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
Anderson-Tully Co., Memphis, Tenn.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr-Holaday Lumber Co., Greenfield, Ohio.
Bruce Co., E. L. Little Rock, Ark.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Clark, Edward & Sons, Toronto, Ont.
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Dudley Lumber Co. Inc., Memphis, Tenn.
Farrin Lumber Co., M. B., Cincinnati, Ohio
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La.
Hafner Manufacturing Co., St. Louis, Mo.
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co., Toronto, Ont.
Kinnon Lumber Co. Ltd., Toronto, Ont.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville, Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Merceau-Hawkins Tie Co., Huntington, W. Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Otis-Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Walnut Co., St. Louis, Mo.
Richards Hardwood Co., Memphis, Tenn.
Rush Lumber Co., Memphis, Tenn.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Sullivan, Frank T. Buffalo, N. Y.
Turner-Faber-Love Lumber Co., Leland, Miss.
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng. & Sales Co., Lockport, N.Y.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

Knobs
Waddell Mfg Co., Grand Rapids, Mich.

LACQUERS
Cosmos Chemical Co., Port Hope, Ont.
Celluloid Zapon Co., New York, N. Y.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rochford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.

LEGS
Klise Manufacturing Co., Grand Rapids, Mich.

MACHINE KNIVES
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

MITRE SAWS
Atkins & Co., E. C. Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.

MOTORS
Industrial Engineering Co., Toronto, Ont.

MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati. Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N. Y.
Yates Machine Co., P. B., Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PAINT
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Calhoun Plywood Co., Sheboyan, Wis.
Hardwood Products Co., Neenah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rochford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

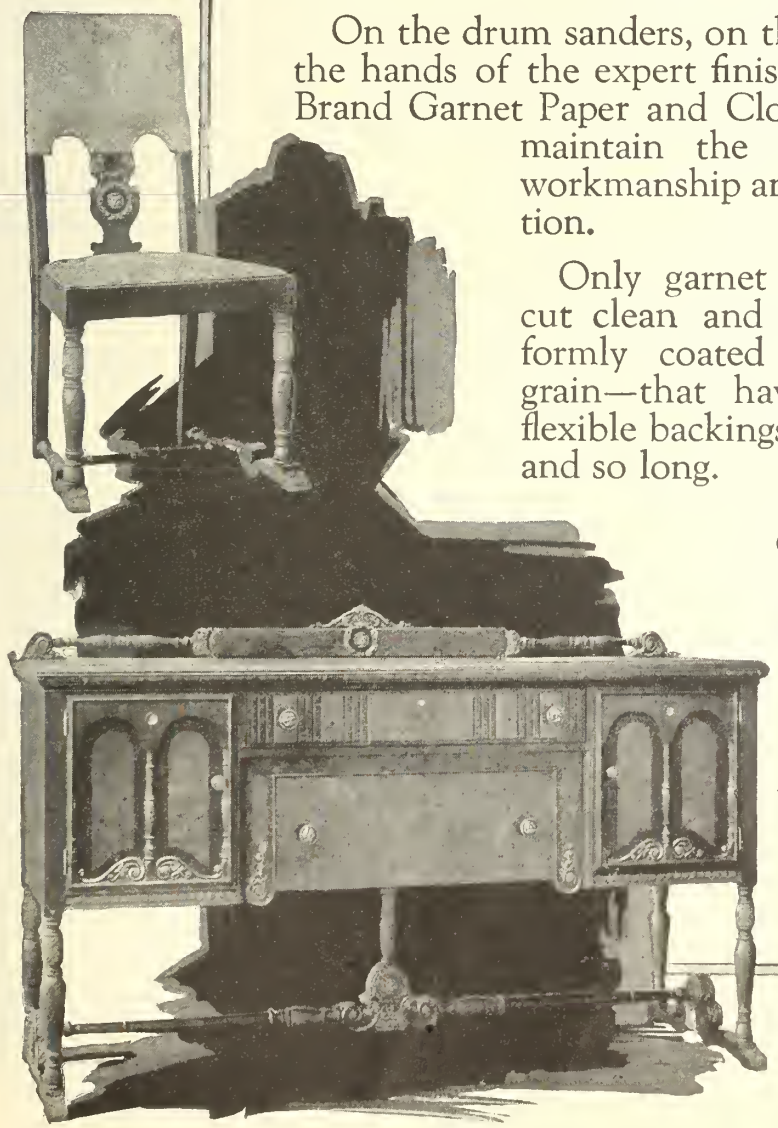
A Record of which we are Justly Proud

THE skill, the artistry—that certain outstanding mark of the master creators of beautiful furniture are evidenced in the products of the Grand Rapids Bookcase & Chair Company of Hastings, Michigan.

We are proud to say that since 1907 Carborundum Brand Garnet Paper and Cloth have dominated in the sanding departments of this plant.

On the drum sanders, on the belt machines, in the hands of the expert finishers, Carborundum Brand Garnet Paper and Cloth enable them to maintain the highest quality of workmanship and adequate production.

Only garnet products that can cut clean and fast—that are uniformly coated with pure, sharp grain—that have strong, durable flexible backings could serve so well and so long.



Carborundum Brand
Garnet Products
Make Good Sanders
Better Sanders

The Carborundum Company
Niagara Falls, N. Y., U. S. A.

New York, Chicago, Philadelphia, Boston, Detroit, Cleveland, Cincinnati, Pittsburgh, Grand Rapids, Milwaukee

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Bury, Robt. & Co. (Can.) Ltd., Toronto, Ont.
Calhoun Plywood Co., Sheboygan, Wis.
Guelph Patent Cask Co., Scotstown, P. Q.
Hay & Co. Ltd., Woodstock, Ont.
Wisconsin Veneer Co., Rhinelander, Wis.

PERIOD MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter, E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FOLLOE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
McKenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co., Herman, Brooklyn, N. Y.

SASH, DOOR & BLIND MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SATINWOOD
Willey Co., C. L., Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P. Q.

SAW FILING MACHINERY
American Saw Filing Machine Co., Boston, Mass.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKenzie Machinery Co., D., Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW TENONERS
Pettingell Machine Co., Amesbury, Mass.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHELLAC
Kasebier-Chatfield Shellac Co.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Bruce Woodworkers Ltd., Chesley, Ont.
Walter & Company, B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis.

TEMPERATURE REGULATORS
Canadian Powers Regulators Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N. Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TOPS
Calhoun Plywood Co., Sheborgan, Wis.
Hay & Co. Ltd., Woodstock, Ont.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont
Klise Manufacturing Co., Grand Rapids, Mich
Walter & Sons, J. Kitchener, Ont.

TWIST WORK
Klise Manufacturing Co., Grand Rapids, Mich.

UPHOLSTERY
Oriental Textiles Co., Oshawa, Ont.

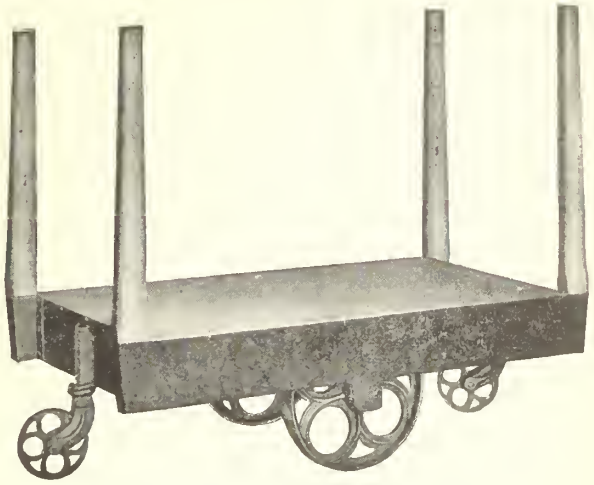
NEW AND USED
Woodworking Machinery

C.M.C. double carriage cut-off saw.
60″ Fay & Egan re-saw.
60″ Egan band re-saw.
54″ McDonough horizontal band re-saw.
42″ West Side band re-saw.
12″ C.M.C. four-side moulder.
American variety woodworker.
No. 551 C.M.C. chain saw mortiser.
18″ Defiance handle lathe.
30″ Boss double surface planer and matcher.
24″ Clark-Demill planer and matcher.
24″ Yates, single surface planer.
24″ Cowan pony planer.
20″ Preston pony planer.
48″ Berlin, three-drum sander.
42″ Invincible three-drum sander.
20″ American wood scraper.
Preston double head tenoner.
Gerlach stave machine.
Long lath bolter.

Write for full particulars and our complete stock list

H. W. Petrie, Limited
131—147 Front Street West
Toronto

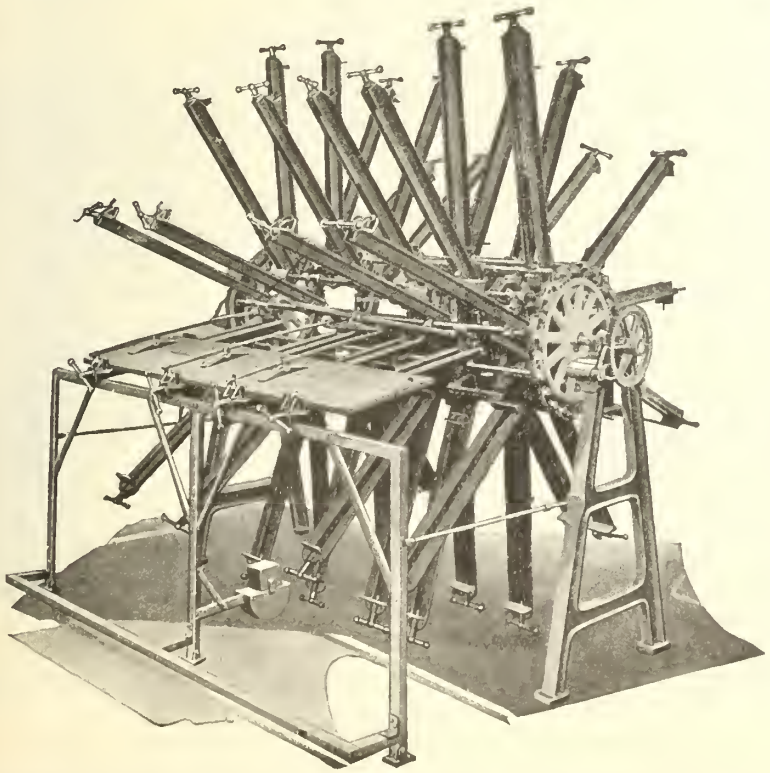
NOW IS THE TIME



To Cut Your Production Cost by Using
"GLOBE"
ALL STEEL FACTORY TRUCKS
Made in 3 sizes :
24″ x 52″ 28″ x 58″ 34″ x 70″

Globe Vise & Truck Co.
GRAND RAPIDS, MICH.

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK

CLAMP CARRIER
for
Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISH DRYERS
Nicholls Co., A. S., New York, N. Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Company, Robert, Toronto, Ont.
Guelph Patent Cask Co., Scotstown, P. Q.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mohawk Veneer Co., Warren, Pa.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co.. Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland, Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N. Y., High Point, N. C.
Wisconsin Veneer Co., Rhinelander, Wis.
Willey Co., C. L., Chicago, Ill.
Wood Mosaic Co., Louisville, Ky.

VENEER CLIPPERS
St. Joseph Iron Works, St. Joseph, Mich.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N. Y.
St. Joseph Iron Works, St. Joseph, Mich.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Des Moines Sawmill Co., Des Moines, Iowa.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.
Sullivan, Frank T., Buffalo, N. Y.

WASTE
Carter, E. T., Toronto, Ont.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

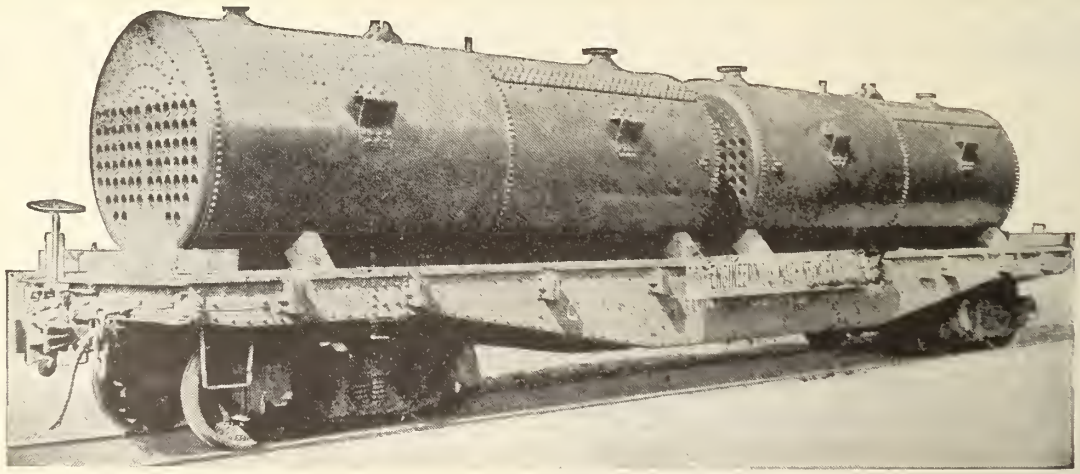
WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WOODWORKING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Elliot Machinery Co., Belleville, Ont.
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Pettingell Machine Co., Amesbury, Mass.

WOOD TURNING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Elliot Machinery Co., Belleville, Ont.
Garlock Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.



Better Business - New Boilers - More Profits

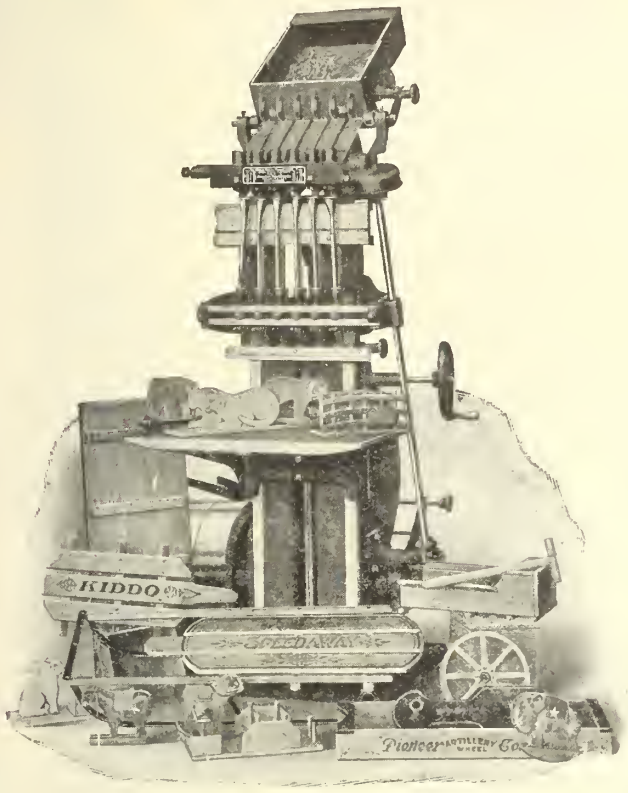
A modern new efficient Boiler from us that will always give you all the steam you want can be a big money maker. The National Hand Operated Stoker—with the new Boiler, or installed under your present ones—will give you wonderful steaming qualities from the cheapest kind of waste fuel—without smoke and using common labour for the stoking.

Let us quote you our attractive prices

Engineering and Machine Works of Canada, Limited

St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal



Morgan No. 6 Nailing Machine

MORGAN
NAILING MACHINES
Used in Nailing Wooden Toys

Many manufacturers of American Wooden Toys use our machines for driving 5/8" to 1 1/8" nails. Machines are adjustable in operation and can be adapted to any kind of nailing work.

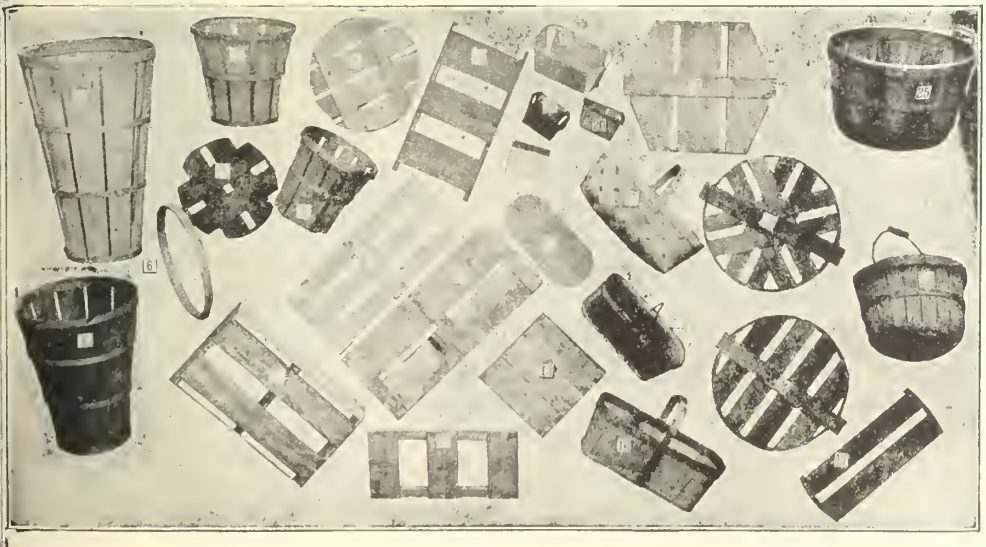
If you are driving nails by hand, in making boxes, crates, toys, any woodenware articles, figure the cost. It is expensive.

Then send us samples of your work. Get an estimate of the cost of nailing on a Morgan Nailing Machine. Compare the figures. We'll leave the rest to your judgment.

Send us your nailing problems. We shall be pleased to give them our careful consideration and advise you regarding equipment for handling them. We invite your inquiry.

Morgan Machine Company
Rochester, N. Y.

THIS IS THE NAME



of the Machinery for the Rapid Production of

Veneer—Crates—
Baskets—Fruit Packages.

"ST JOE"

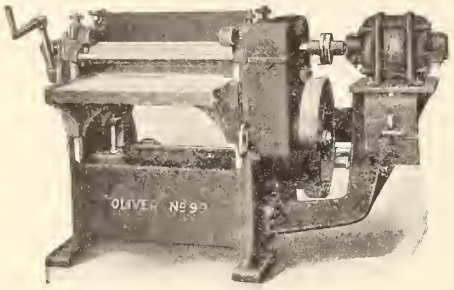
Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

GAINING FAVOR—

For quick and accurate work the OLIVER No. 99 Pony Planer has no equal. Compactness, modern design and coustruction are its outstanding features. Remember we make 36" DOUBLE FAST FEED SURFACERS down to 20-inch pony planers.

Let us know your requirements



Oliver Machinery Co.

Grand Rapids, Michigan, U.S.A.

Manufacturers of High grade Woodworking Machinery and Machine Tools

MOTORS

RELIABILITY - KNOWLEDGE - PRICE

Motors—60 Cycle

1—3 H.P. Packard, 3 phase, 220 or 550 volts.
6—1/6 H.P., single phase new.
1—5 H.P. Can. Gen. Electric.
1—7½ H.P. Lincoln, and one 7½ H.P. Fairbanks.
1—10 H.P. Gen. Elec. and Lincoln.
1—20 H.P. General Electric.
1—30 H.P. newly rewound by Swedish General Electric.
4—25 H.P. General Electric.
1—50 H.P. General Electric.
1—75 H.P. General Electric.
1—100 H.P. Westinghouse and General Electric.
Above 5 H.P. motors equipped with regular starters.

Motors—25 Cycle

1—5 H.P. Crocker-Wheeler, 1500 r.p.m., 220 volts.
1—2 H.P. Langdon Davies, 1500 r.p.m., 500 volts.
1—40 H.P. Westinghouse, 720 r.p.m.
1—15 H.P. British Gen. Elec.

Other various sizes and new Westinghouse stock all sizes.

Direct Current Motors and Generators
125-250 Volts

1 K.W.
2 K.W.
3 K.W.
5 K.W.
10 K.W.
} Westinghouse Can. General Elec. Lincoln.

Complete with rheostats and pulleys.

60 Cycle, 3 Phase Generators

60 Cycle, 3 Phase Generators
30 K.W.
50 K.W. 1200 r.p.m. General Elec. and Westinghouse.
75 K.W. Westinghouse.
100 K.W. General Elec., 2300 volts, 900 r.p.m.
300 K.W. Westinghouse, 200 r.p.m.
600 K.W. Electrical Machinery 225 r.p.m.
All. complete with exciters and rheostats.

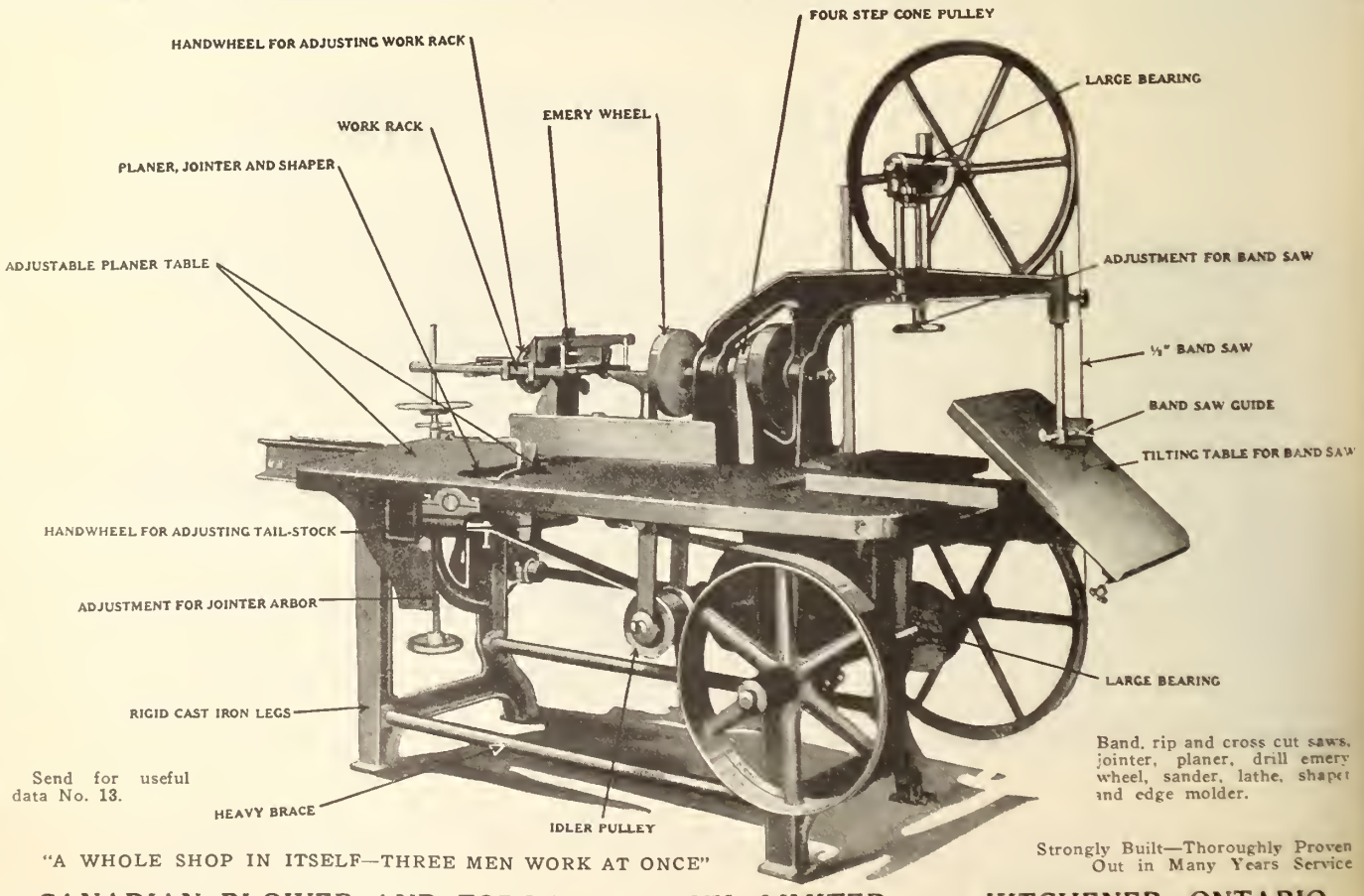
2—175 H.P., 3 cylinder gas, gasoline or crude oil Westinghouse Vertical Engines —250 r.p.m.

Industrial Engineering Company of Canada Ltd.

CONSULTING ENGINEERS - ELECTRICAL EQUIPMENT

R. G. LEE, General Manager

Carlaw Building, Toronto - Royal Bank Building Windsor, Ont.



Send for useful data No. 13.

Band, rip and cross cut saws, jointer, planer, drill emery wheel, sander, lathe, shaper and edge molder.

"A WHOLE SHOP IN ITSELF—THREE MEN WORK AT ONCE"

Strongly Built—Thoroughly Proven Out in Many Years Service

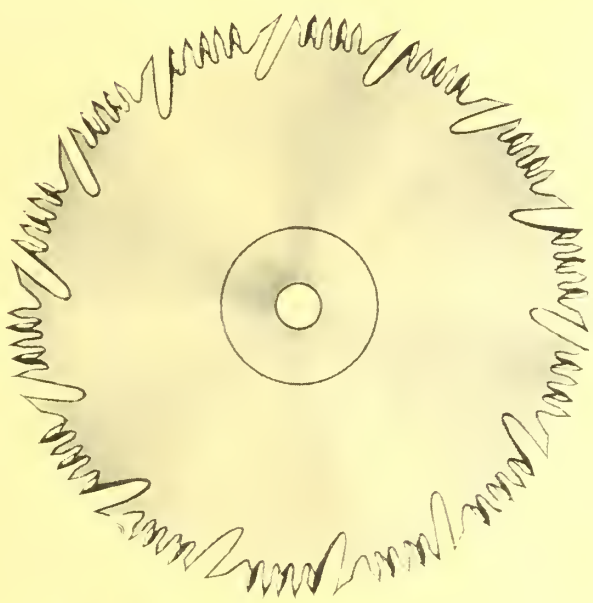
CANADIAN BLOWER AND FORGE COMPANY, LIMITED - KITCHENER, ONTARIO

Like the Swords of Old Damascus

Beaver Brand saws and tools remain true to their careful manufacture throughout their long life.

They are like thoroughbreds, responding to every demand —saws to be relied on.

We are also agents for saw tools, machine knives, hoe shanks and bits, emery wheels, shafting, belting, files, and filing room machinery.



Give your saw repairs into the hands of our experts. Be sure that name of owner appears on each saw, and mail full instructions of work to be done, stating the hand, speed and feed of mill together with shipping directions for return of saws.

Radcliff Saw Manufacturing Company, Limited

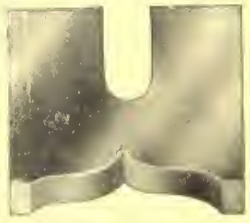
1550 Dundas Street West **TORONTO, ONT.**

ATKINS

STERLING QUALITY

SAWS and KNIVES

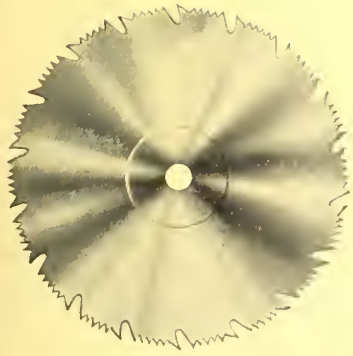
ECONOMIZE



ARE your saws and knives wasting your lumber? If so, why not turn that waste into a profit by installing

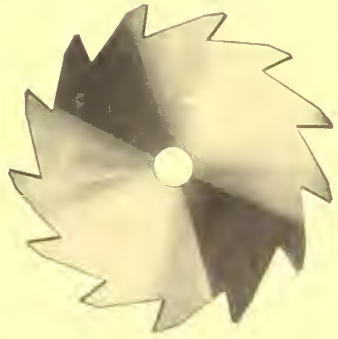
Atkins Sterling Quality Saws

and Machine Knives



Some of the largest woodworking mills in the country are using Atkins Saws exclusively, because they increase production, stop waste and make a name for themselves wherever they go.

Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.

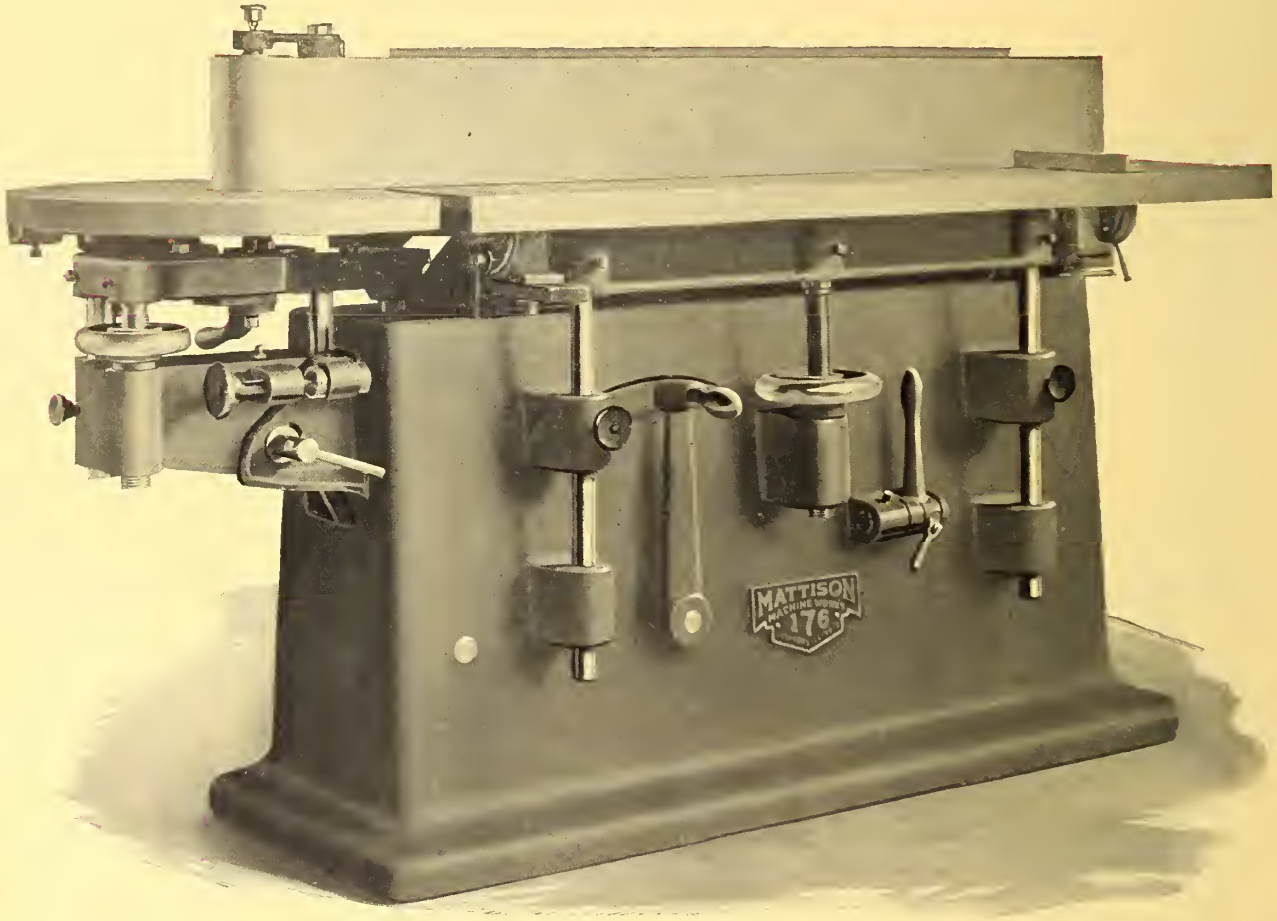


E.C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

MATTISON
176
Oscillating-Belt Edge Sander



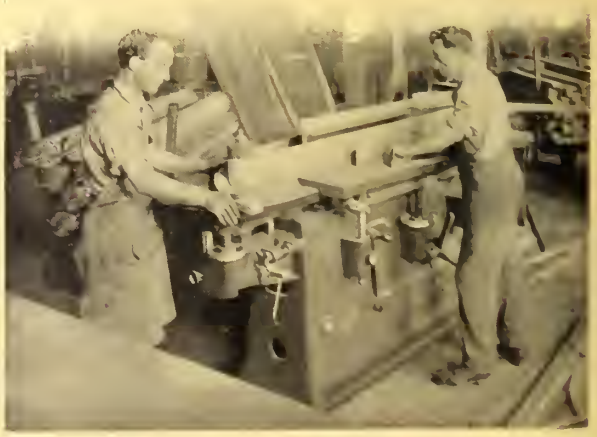
The Improved Model Stands Supreme

RECENT mechanical improvements place this Sander far ahead of similar types. Spiral gears have been replaced by spur and bevel gears running in an oil bath, eliminating wear. Front sanding roll runs in ball-bearings and is supported by an overhead bracket. Many operating conveniences are supplied to quicken the finishing of all kinds of edges, either straight or irregular.

Delicate work, such as the finishing of square or octagonal turnings having small ornamental members, is handled with speed and accuracy because rigid construction and vibrationless sand belt travel make the use of small spindles and narrow forms, entirely practical.

Put your sanding problems up to us. We have saved labor and increased production for others and can do likewise for you.

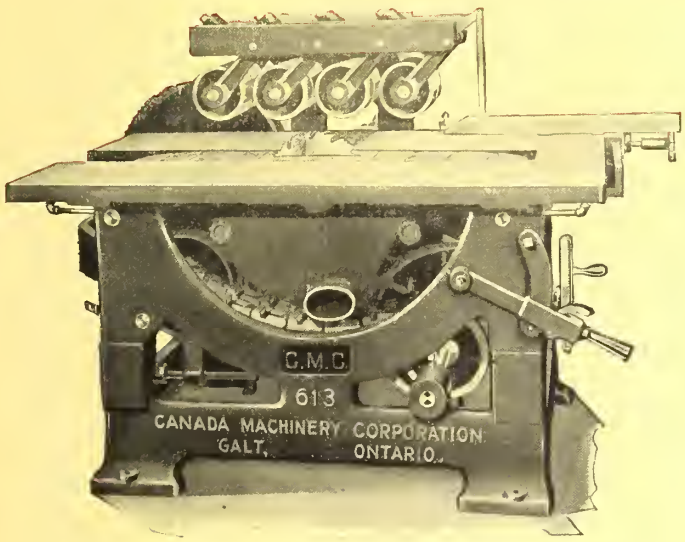
"Our cabinet foreman is greatly pleased with the sander, especially the oscillating movement which not only increases production, but also economizes on sand belts. We find it well adapted to scroll edge sanding as well as straight."—Macy Co., Grand Rapids, Mich.



MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.

olume Twenty-Two TORONTO November, 1922 Number Eleven

CANADIAN WOODWORKER and Furniture Manufacturer



"The Better Line"

C.M.C.

No. 613 Light Ripping and Jointing Saw

"A Profit Producer.'

The logical machine for medium ripping and jointing in furniture factories and woodworking shops.

It rips core stock so true and straight that it can be immediately glued together without further correction, and when a tongue or V joint is required, the smallest cut on a jointer is sufficient.

Saves time, stock and power. Protects the operator and produces quality work in great quantities.

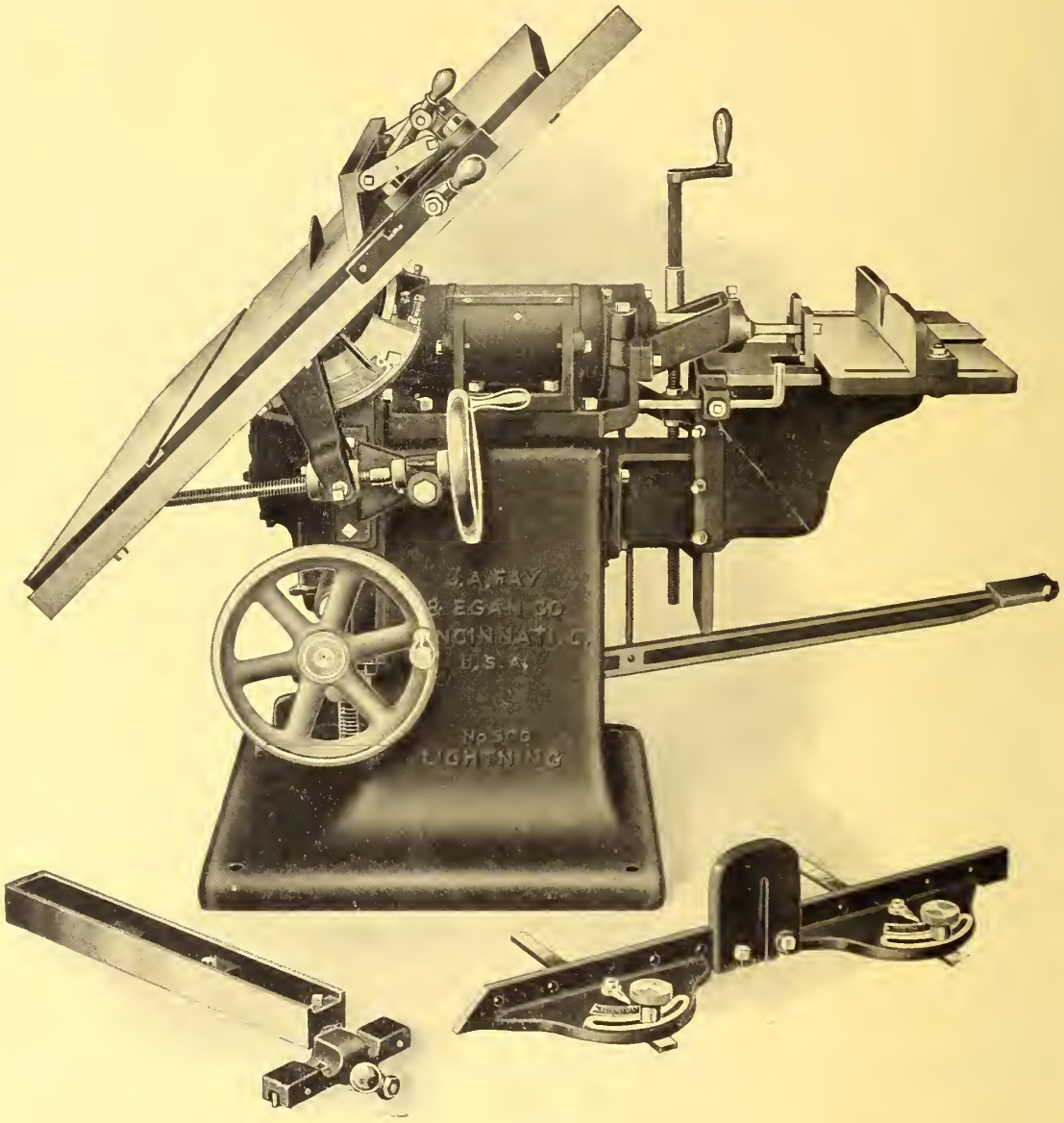
Write for bulletin today.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office, - 721 Bank of Hamilton Bldg.

Alphabetical Index to Advertisers, Page 12

An embodiment of the highest degree of engineering skill—devoted to building into every unit the utmost quantity of saw power.



No. 500 "Lightning" Shaftless Motor Driven Variety Saw.

No belts. No countershafts. Motor mounted directly on column, impossible to get out of line. Motor direct on arbor. Table can be tilted to any angle up to 45. Stopped and started by totally enclosed switch.

J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St. - - Cincinnati, Ohio, U. S. A.

Exclusive Agents for the Dominion: A. R. Williams Machinery Company, Ltd., Toronto, Ont.
Branches: Montreal, St. John, N. B., Winnipeg, Vancouver

BELOW YOU WILL FIND A PARTIAL LIST OF OUR WOOD WORKING MACHINES IN STOCK. ALL EXCELLENT BARGAINS. OUR STOCK IS TURNING RAPIDLY, ADDITIONS BEING MADE PRACTICALLY DAILY. IF YOU DO NOT SEE HERE A MACHINE YOU WANT, WRITE US YOUR REQUIREMENTS. OUR LINES ARE COMPLETE FOR ALL TYPES OF WOOD WORK-WORKING SHOPS.

Moulders

Stock No.
2628 1—Cowan 13″ Four Sided, rebuilt.
2635 1—Cowan 10″ Four Sided, rebuilt.
2621 1—Hespeler 10″ Four Sided, rebuilt.
2629 1—American 8″ Four Sided, rebuilt.
2636 1—Cant-Laidlaw 8″ Four Sided, used.
2637 1—Cant-Gourlay 8″ Four Sided, used.
2638 1—Two Sided Dowel Sticker, used.
2679 1—Cowan 10″ Four Sided, used.
2682 1—Rogers & Co. 8″ Four Sided, used.

Saws

2593 1—American No. 30 Double Arbor Universal Saw Bench, new.
2599 1—American No. 35 Edging Saw, new.
2602 1—American No. 3 Double Cut-off Saw, new.
2622 1—Preston No. 132 36″ Band Saw, practically new.
2631 1—Mershon Band Edging Saw, used.
2612 1—Blind Slat Resaw, used.
2600 1—American No. 1 Single Spindle Shaper, used.
2604 1—Ballantine Two Spindle Shaper, rebuilt.

Mortisers

2632 1—C.M.C. No. 507 Power Chisel Mortiser, new.
2594
2595 2—Miller Hand Mortisers, new.

Hardwod Flooring Machines

2624-5 2—American No. 229 Hardwood Flooring Machines, rebuilt.

Circular Resaws

2654 1—American No. 4 Circular Resaw.

Surfacers

2620 1—Preston No. 121 24 x 8 Single Surfacer, new.
2619 1—Jackson-Cochrane 24 x 6 Endless Bed, rebuilt.
2618 1—Cameron 24 x 6 Endless Bed, single used.
2683 1—Goldie-McCullock Buzz Planer (Hand Jointer, used.
2601 1—Jackson-Cochrane 24 x 6 Single Surfacer No. 5 Endless bed, used.
2678-7 2—Major Harper 24″ Single Surfacers, used.

Sanders

2603 1—American No. 6 Double Disc Sander, rebuilt.
2606 1—American No. 2 Universal Sander, new.
2690 1—McGregor Gourlay 42″ Three Drum Sander, used.
2680 1—Jig Sander, oscillating, used.

Tenoners

2623 1—Cameron Single End Tenoner, used.
2700 1—Cant-Laidlaw Single End Tenoner used.

Boring Machines

2655 1—Post Boring Machine, used.
2614 1—Boring and Turning Machine for circular work, used.

Blowers, (Fans)

2642 1—American 55″ Single Slow Speed Exhaust Fan, used.
2643 1—Sheldon Co. Single Shaving Exhaust Fan, used.
2646 1—Sheldon 40″ Double Shaving Exhaust Fan, used.
2647 1—McEachern Single 40″ Shaving Exhaust Fan, used.
2648 1—Detroit No. 16 45″ Single Shaving Exhaust Fan, used.
2649 1—Sturtevant 48″ Ventilating Fan, used.
2641 1—Sheldon 36″ Single Shaving Exhaust Fan, used.

Miscellaneous

2699 1—Covel Saw Grinder, used.
2617 1—McGregor-Gourlay Power Feed Dowel Machine, used.
2592 1—Cowan M-277 Automatic 32″ Cupwheel Knife Grinder, rebuilt.
2645 1—Cowan Veneer Press 38″.
2605 1—Reynolds No. 2 Power Screw Driver, rebuilt.
2607 1—Dodds 10 Spindle Dovetailer, used.
2611 1—Oliver No. 3 Wood Trimmer, used.
2613 1—McGregor-Gourlay Door Relisher, used.
2616 1—Knob Turning Machine, used.
2661 1—Crescent Rope Moulding Machine, used.
2650 4—Embossed Moulding Machines, used.
2597 1—Safety Guard, new.
2598 1—Safety Guard, new.
2664 2—Shaving Separators, used.
2596 1—Patternmakers Vise, used.
2689 1—Jackson-Cochrane Veneer Press, used.

GARLOCK MACHINERY LIMITED
WOOD WORKING AND METAL WORKING MACHINERY
163 DUFFERIN ST. TORONTO TELEPHONE, PARKDALE 7855
Specialists in Wood Working Machinery

Consider the Job
-not the price

No matter what price you pay—you get just what you pay for.

A "cheap" job—done at a price—may be all right for a time, but it is found to be costly in the end—to say nothing of the inconvenience and delays that are sure to result.

When your Blower or Exhaust system is installed by us, you KNOW you are getting the service of efficient engineers backed up by years of experience.

The Toronto Blower Co.,
City.

Dear Sirs:-

I have pleasure in writing this letter in regard to the Blower Systems you installed in my factory last year. Both the shaving and the separate sawdust systems are working very satisfactorily and I know we have as good a job of piping as it is possible to put up. This work was done under the direction of your Mr. Daniels, whom I consider a very good mechanic.

Yours truly,
T. H. Hancock.

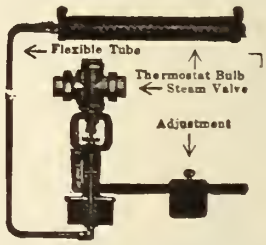
The Foster Fan lifts a maximum load and saves power doing it. Handles every conceivable kind of material—wet or dry—without clogging.

Why not send for our illustrated folder?

The Toronto Blower Co.
156 Duke St., - TORONTO

YouDon'tGuessTime! WhyGuessTemperature?

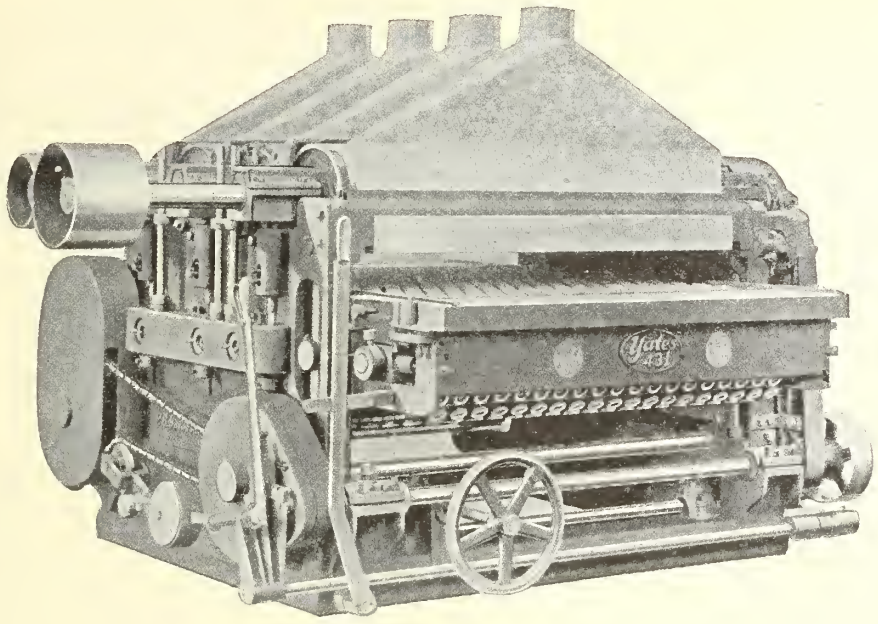
In the glue kettle, the varnish drying room, the dry kiln—wherever there is a need for maintaining a definite, even temperature, the Powers Automatic Heat regulators give "100 per cent perfect" results. They are always on the job—accurate, sure, reliable. They prevent overheated glue, checked or case-hardened lumber, crazed varnish—all the errors that are so apt to creep in with manual control.



The Powers Regulator No. 15
Entirely self-contained. Peculiarly adapted for control of drying room, kiln, etc.
Other Powers Regulators for other places. Ask for details.

We shall be glad to give you the benefit of our more than thirty years experience in temperature regulation, and if you will tell us where you would like to try out a Powers Regulator, we will send the right one for thirty days' trial. If you don't find it satisfactory, send it back.

The Canadian POWERS REGULATOR Co Ltd
Specialists in Automatic Heat Control
82 Chestnut Street — Toronto, Ont.
Calgary, Alta. Halifax, N.S. Montreal, Que.
Vancouver, B.C. Winnipeg, Man.
Please consult your telephone directory for local address.
(1079D)



Advantages that will Appeal to Users of Sanding Machines

Sand paper on the drums can be tightened up at each end independently or simultaneously. This is a great help when putting on the paper as it saves considerable time.

Should the paper become loose on the drums while machine is in operation, slack is taken up automatically, thus preventing paper buckling or tearing, which affords a saving in the sand paper used. The felt and paper are wound on the drums spirally, which gives you continuous cutting drums, furnishing a much smoother finish.

These are exclusive features embodied in Yates Endless Bed Sanders only.

Has automatic stop to prevent bed from running up into sanding drums. Yates Endless Bed Sanders are adapted especially for sanding narrow and short stock, taking pieces short as 3 inches. Will handle the big stock as well.

Built in three sizes 31, 43 and 49 inches wide.

Our Sander book describes this machine fully, as well as showing many different types and outlining their various uses.

P. B. Yates Machine Co. Ltd.

Hamilton - Ontario

The Invariable Choice Yates Of the Man Who Knows

YATES

The Invariable Choice Yates Of the Man Who Knows

"Fire Me"

said a progressive salesman to the Manager. "I am costing the House too much. I am spending so much of my time explaining to prospective customers who I am, who my House is, what my goods are, and why they are worth buying, that I don't have much time left for selling. Do all this preliminary work for me by means of effective advertising before I reach the Furniture Dealer's store. It can be done better and cheaper this way than I can ever hope to do it."

FURNITURE WORLD

Hugh C. MacLean Publications Limited
Toronto Montreal Winnipeg Vancouver

The wise manufacturer uses Furniture World not only to save his salesmen time but also to save the time of the Jobbers' salesmen.
The "open door" to the Furniture field is the "Furniture World" which for years has earned and held the confidence of advertiser and buyer.

A Few Bargains In Woodworking Machinery and Electric Motors
for immediate shipment.

WOODWORING MACHINERY

New Smith Combined Chain and Hollow Chisel Mortiser. (made in England.)
Used 30" Harper Band Saw.
Used 42" Berlin Royal Invin. 3 drum Sander.
Used C.M.C. 107 Planer and Matcher.
Used Cowan 26" Double Surfacer.
Used No. 177 Berlin Double Surfacer.
Used Ober Axe Handle Lathe.
Used 24" 3 Side Cowan Planer and Matcher.
Prac. New No. 125 Preston Saw Table.
New No. 109 Crescent Woodworker.

ELECTRIC MOTORS

3 phase, 25 cycle, 550 volts

Used 3 H.P. Westinghouse 720 RPM.
Prac. New 5 H.P. Lancashire, 720 RPM.
Used 10 H.P. Westinghouse, 1500 RPM.
Used 40 H.P. Westinghouse, 720 RPM.

3 phase, 60 cycle, 550 volts

Prac. New 3 H.P. Westinghouse 1800 RPM.
Prac. New 5 H.P. Westinghouse 1800 RPM.
Used 10 H.P. C.G.E. 900 RPM.

We have a large stock of Electric Motors and Generators of all characteristics. Send your enquiry along to us and let us save you money. All electrical equipment in first class order.

We can save you money on Woodworking Machinery. The above represents a few selections only but we have an exceptionally large stock of both new and used machines. Send us your enquiry, which we assure you will have our very prompt and careful attention.

If it's Machinery—Write "Williams"

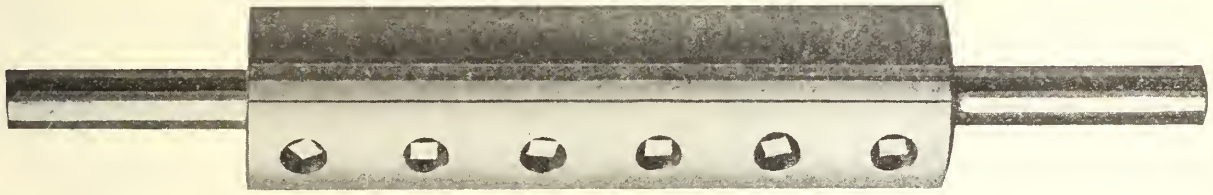
The A. R. Williams Machinery Co., Ltd.

Dept. C.W., 64 Front St. W., Toronto

Phone Woodworking Department—Adelaide 20

Halifax - St. John - Montreal - Winnipeg - Vancouver

The Shimer Round Safety Cylinder with High Speed Knives



A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

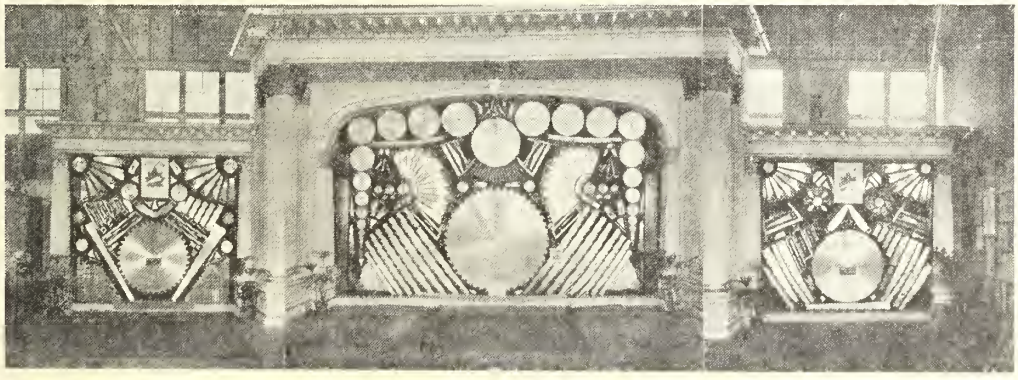
Made for any of the Different Makers' Machines and in Any Length Cylinder

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO



MAPLE LEAF SAWS

Used and Approved From Coast to Coast

Cross-Cut Saws	Special Saws	Circular Saws
Band Saws	for	Hand Saws
Dado Heads	Special Work	Woodworking Cutters and Knives.

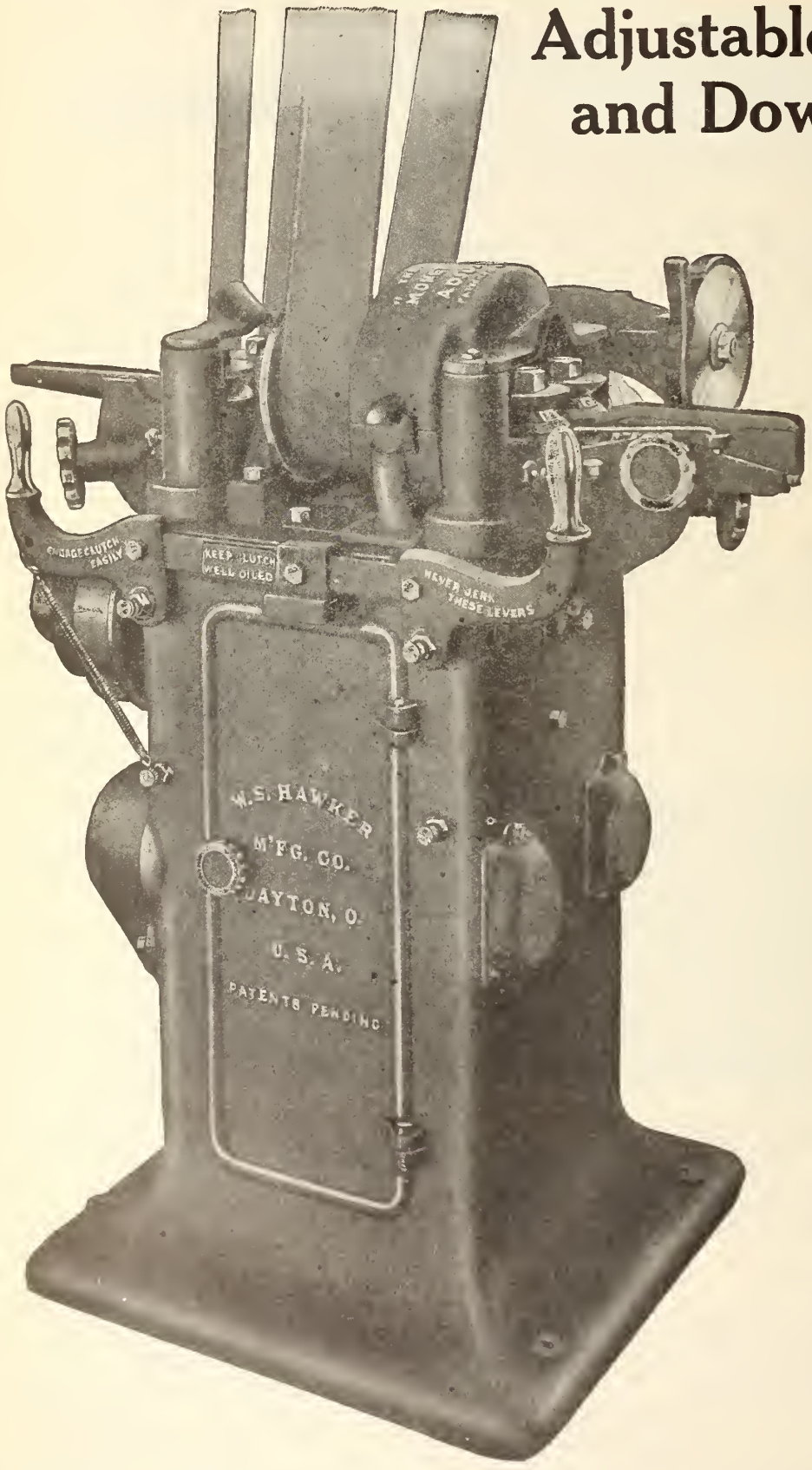
Because of their special Razor Steel and our own secret tempering process Maple Leaf Saws retain their keen cutting edge despite the hardest use and outlast all ordinary saws.

Manufactured by

Shurly-Dietrich Limited---Galt, Ont.

Branch and Warehouse, Vancouver, B. C.

The Money Maker— Adjustable Rod and Dowel Machine



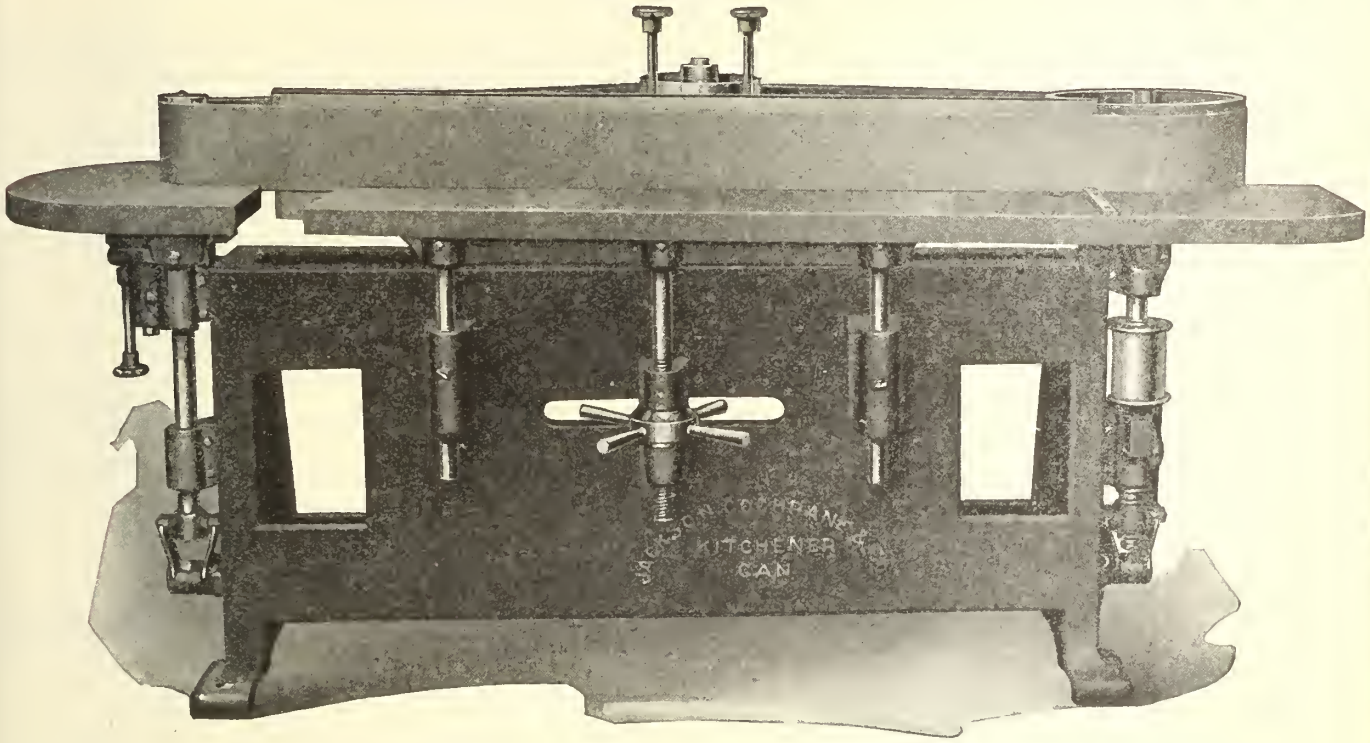
Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely
Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio

No. 272 Oscillating Belt Sander



No. 272. Oscillating Belt Sander for Edged and Shaped Work

This style of belt sander has a capacity several times greater than sanding drums or spindles. The high speed sand belt covers a long surface and retains its sharp and fast cutting properties. The long travel of the belt gives it an opportuntiy to cool off between contacts, whereas on drums and spindles, where the sanding surface is small, the wear is continuous and in one place.

It will also finish practically any piece of straight or bent work that can be supported on the tables or held against the platen or sanding rolls.

The design and construction eliminates all chance of vibration, thus insuring a perfect sanding contact. The tables provide an even and accurate support for the work, and as the belt travels with an oscillating movement, a perfect finish is assured.

The tables are the proper height and permit the operator to handle his work in a natural position. Numerous sizes of sanding rolls, special forms for shaped work and non-revolving sanding spndles may be used for sanding a large variety of work. The long platen between the sanding pulleys may be removed and replaced with special forms for any work having rounded edges.

This sander is so constructed that a number of stationary forms may be used for special work.

Features of Our No. 272 Oscillating Belt Sander

Heavy construction eliminates vibration.

Long belt surface prolongs life of sand belt.

Oscillating movement prevents scratch marks.

Belt pulleys covered with heavy coating of rubber provide a good driving surface and a perfect sanding cushion.

Large tables and each adjusted independently of the other.

S.K.F. ball bearings in small belt pulley.

Improved belt tightening device.

Convenience of operation.

Large capacity.

Very moderate price.

Large descriptive circulars now ready. Send for one and get full particulars on this Sander.

Specifications:

Large Sand Belt Pulley.....14″ dia. x 8½″ face
Small Sand Belt Pulley.....3½″ dia. x 8½″ face
Circular Table.....25″ wide
11″ from spindle to end.
19″ long overall.

Long Table.....72″ x 12″
Platen.....60″ long 9½″ wide
Centre to centre of pulleys....72″
Idler Pulley.....10″ dia. x 9″ face
Floor Space.....8′ x 3′ 6″

Jackson, Cochrane & Company

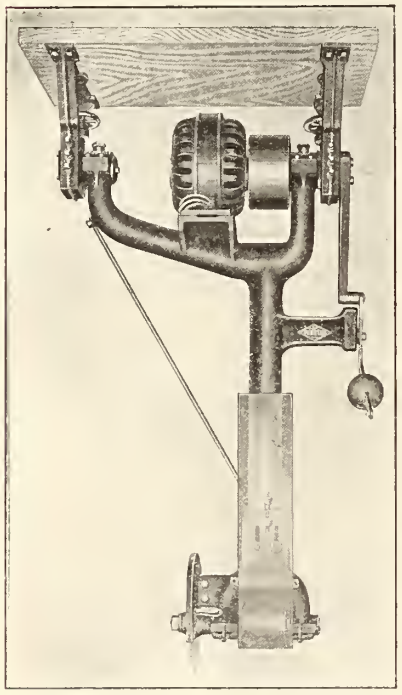
Manufacturers of Woodworking Machinery. : KITCHENER, ONTARIO

Service and

"PROFIT" IS NOT the idea of FIRST IMPORTANCE in our building machinery. "SERVICE AND SATISFACTION TO THE CUSTOMER" IS the idea of FIRST IMPORTANCE. We give the Best We Have and Put the Best We've Got into Our Work—Your Machines. This we have done consistantly and OUR REWARD is that slowly but surely we are getting the reputation about the country of being a dependable firm, supplying only the very best and the most reliable woodworking machinery and standing behind it "for better or for worse."

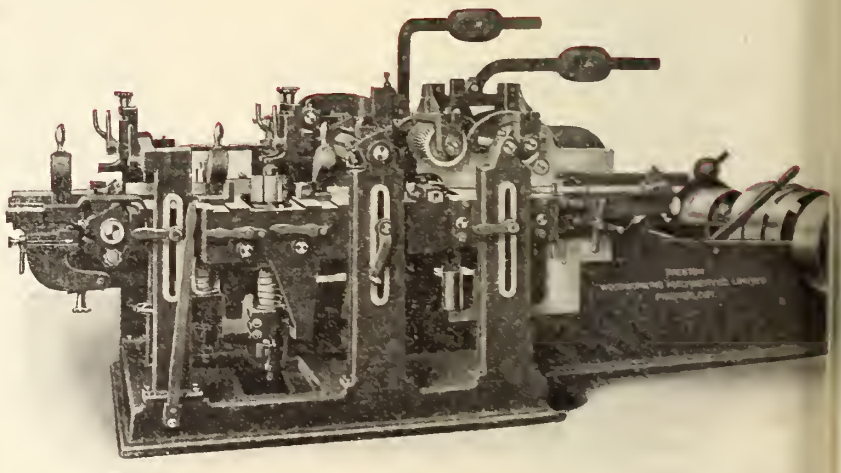
To maintain this reputation we are constantly on the lookout for new improvements and inventions in equipment, to pass on to our customers. In purchasing from us you ensure yourselves getting most modern and up-to-date Wood Tools.

"Make Assurance Doubly Sure:—



No. 152 "Preston" Motor Driven Swing Cut Off Saw

Note belt guard. Built with special arrangement providing for use of an endless belt. Every requirement of a swing cut off saw is combined in this machine.



No. 145 "Preston" Heavy Four-side Moulder on Base

To match 10", 12" or 13" wide. Table lowers 12". Has S.K.F. ball bearings for end thrust on side heads and is equipped with S.K.F. ball bearings throughout when desired.

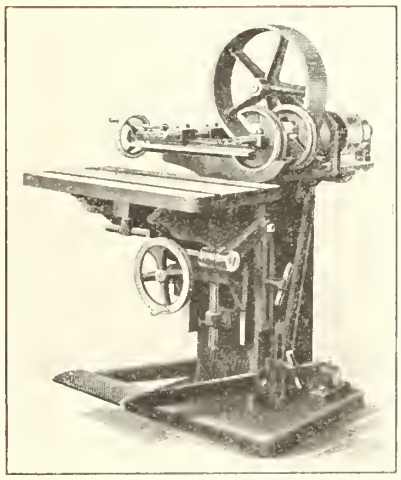
The PRESTON WOODWORKING

PRESTON

Satisfaction

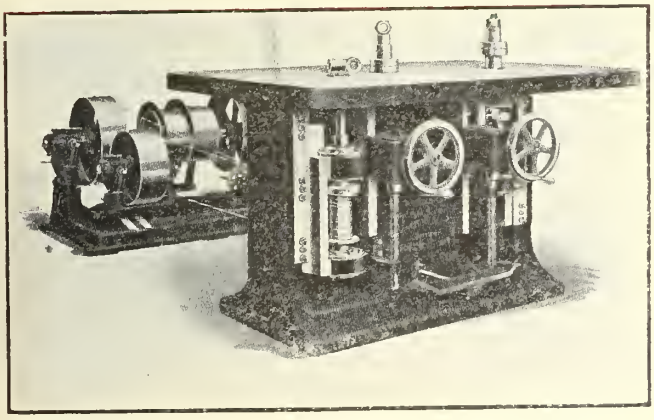
In this advertisement are illustrated a few of the standard tools we manufacture. Woodworking tools for any special purpose are also designed and produced by us. The illustrations of the machines are necessarily small, and the descriptions meagre, but we would appreciate an opportunity to send you detailed information and illustrations of any machine and to quote you on your requirements.

Buy Preston Machines"



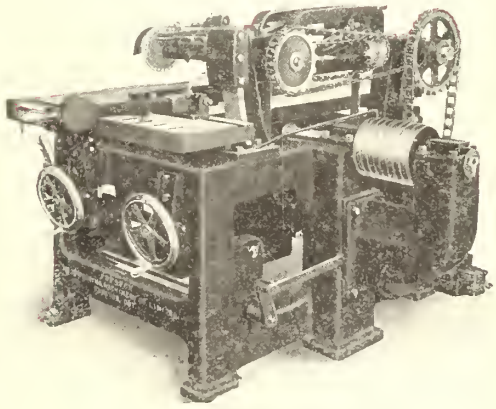
No. 178 "Preston" Double Horizontal Boring Machine

With eccentric adjustment of intermediate gear.



No. 162 "Preston" High Speed Ball Bearing Shaper

Guaranteed advantages over babbit bearing machine. 100% more work and 100% better work. Made either single or double spindle Detachable spindle tops. Specially selected ball bearings.



No. 129 "Preston" Power Feed Rip Saw

A machine that will save labor and increase production. The frame is one solid casting. Every bearing is self-oiling. Both table and upper works are raised and lowered by hand wheels. The feed is variable and quickly regulated. A machine that gives 100% service 100% of the time.

MACHINERY COMPANY, Ltd.

ONTARIO

Alphabetical List of Advertisers

Adjustable Clamp Co. 21
Anderson, Shreiner & Mawson 32
Atlantic Lumber Co. 48
Atkins & Co., E. C. 111
Atlas Mfg. Co., of Orlando 30

Batavia Clamp Co. 21
Banning, Leland G. 49
Behr Co., Inc. Herman .....
Bigelow-Cooper Lumber Co. 43
Barr-Holaday Lumber Co. 35
Birds Eye Veneer Co. 80
Black Bros. Co. 25
Blocksom & Company 73
Bruce Company E. L. 38
Bruce Woodworkers Ltd. 30
Brown Corporation 34
Buffalo Hardwood Lumber Dealers 42
Bury & Co., Robt. 50

Canada Machinery Corporation 1
Canada Wood Specialty Co. 46
Canadian Appraisal Co., Ltd., The 107
Canadian Blower & Forge Co. 110
Canadian General Lumber Co. 95
Canada Glue Co. 18
Canadian Powers Regulator Co. 4
Canadian Nashua Paper Co. 30
Canadian S. K. F. 103
Cannon Canadian Co., Ltd. 18
Carborundum Co. 105
Carter & Co., E. T. 78
Casein Mfg. Co. 18
Celluloid Zapon Co. 78
Chapman & Dewey Lumber Co. 27
Clamp Nail Co. 27
Clark Edward & Sons, Ltd. 44
Coignet Chemical Products Co. 18
Colborn, C. B. 40
Comfy Cushion Co. 73
Cosmos Chemical Co. 77
Cowan & Co. 12
Cutler Desk Co. 16

Decorators Supply Co. 20
Delaney & Pettit Limited 74
Des Moines Sawmill Co. 36
DeVilbiss Mfg. Co. 79
Dominion Appraisal Co. 107
Dry Kiln Door Carrier Co. 25

Eagle-Ottawa Leather Co. 73
Eaton & Sons J. R. 39

Farrin Lumber Co., The M. B. 50
Fay & Egan Co., J. A. .....S..... 2
Foster, Merriam Co. 22

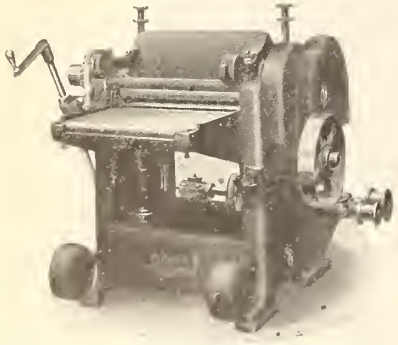
Garlock Machinery Ltd. 3
General Machinery Co. 99
Globe Vise & Truck Co. 107
Grand Rapids Vapor Kiln 13
Guelph Patent Cask. Co., Ltd. 85
Gulf Lumber & Trading Co. 41

Hardwood Mfg's. Institute 28
Hafner Mfg. Co. 46
Hartzell, Geo. W. 37
Hay & Co. 91
Hay & Co., Peter 99
Hawker Mfg. Co., W. S. 8
Hoffman Bros. Co. 84
Hyde Lumber Co. 40

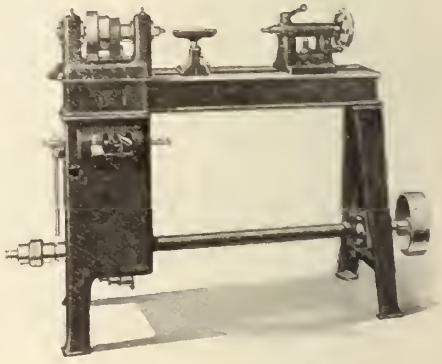
Ideal Fence & Spring Co., of Canada Ltd. 74
Industrial Engineering Co. 110

Jackson Cochrane & Co. 9

Kane Mfg. Co. 20
Kasebier Chatfield Shellac Co. 25
Kinnon Lumber Co. 99
Klise Mfg. Co. 24
Klotz Machine Co. 38
Kosse, Shoe & Schleyer Co. 41
Kraetzer-Cured Lumber Co. 97

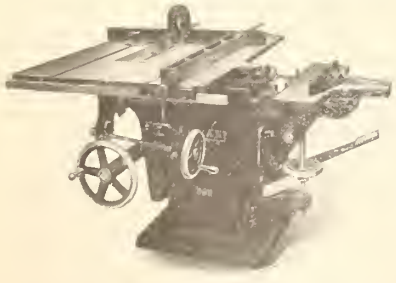


PONY SURFACE PLANER 182
Planes 16", 20" or 24" Wide, 6" Thick



SPEED LATHE 330
Ball Bearing, 12", 14" and 16"
Swing, 4', 5', or 6' Bed

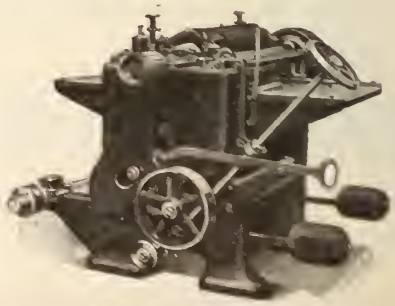
WOODWORKING MACHINERY



VARIETY SAW 230
With or without Boring and Mortising Attachment

COWAN'S

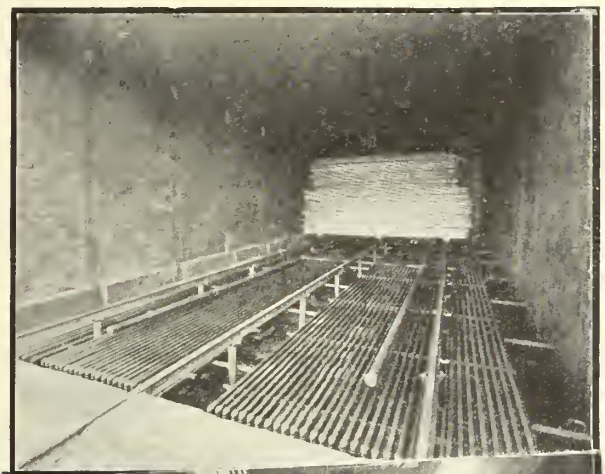
Galt,
Ontario,
Canada

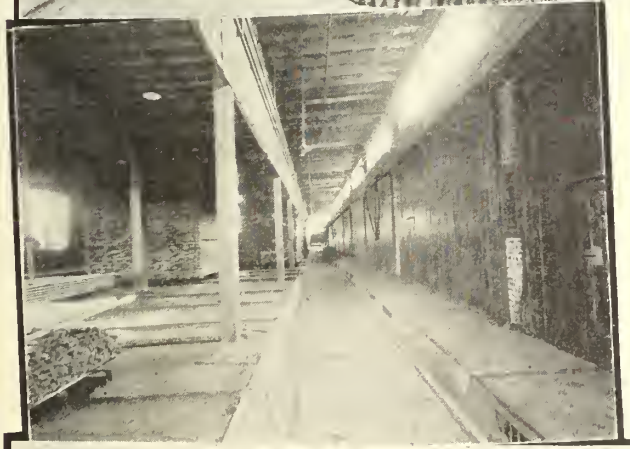


SURFACE PLANER 141
20", 24" and 26" x 8"

The American Seating Co. and the GRAND RAPIDS VAPOR KILN

The 3 photographs reproduced below were taken in the Grand Rapids plant of the American Seating Company and show typical kiln interior, transfer track and front battery of kilns and exterior view.
The American Seating Company has placed 3 orders with us—increasing their equipment as the Grand Rapids Vapor Kiln proved itself superior. Today they depend on a battery of 10 Grand Rapids Vapor Kilns to supply all their requirements for kiln dried stock.





We reproduce herewith 3 views of Grand Rapids Vapor Kiln installation at the new Grand Rapids, Michigan plant of the American Seating Company. This installation is merely typical—In Canada 250 units of the Grand Rapids Vapor Kiln are installed in over 83 progressive wood working plants, such as Weber Piano Co., Jacques Furniture Co., Kindel Bed Co., and Office Specialty Co. In a large percentage of these plants the Grand Rapids Vapor Kiln installation was made to supply new drying capacity but in a still greater percentage, these installations of Grand Rapids Vapor Kilns replaced other equipment that was proving too costly in the meantime, as well as unable to dry woods properly and economically. For safety, speed of drying and ideal results, there is no equipment equal to the Grand Rapids Vapor Kiln—the method and means for drying woods better in less time.

We maintain, as the very foundation of our continued leadership, America's most highly specialized and efficient laboratory service serving the woodworking industry. Technical bulletins covering practically every phase of wood curing problems are yours FREE upon request and the personal service of your corps of experts here and abroad is offered without placing you under the slightest obligation. Write us.

GRAND RAPIDS VAPOR KILN

Engineers, Manufacturers, Contractors

Main Office and Factory: GRAND RAPIDS, Mich., U. S. A.

FOREIGN OFFICES:

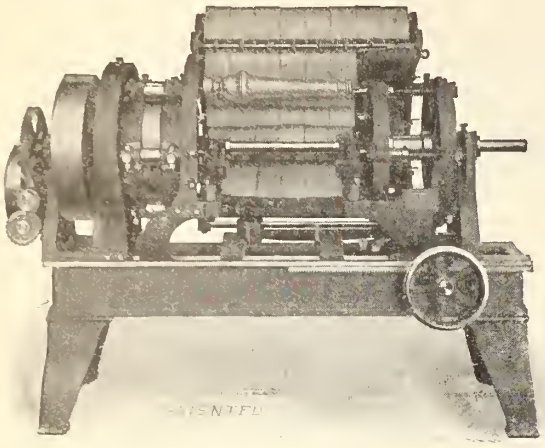
BOORMAN & BOORMAN
Sydney, Australia

THE OLIVER MACHINERY CO.
Manchester, England

A. R. WILLIAMS MACHINERY CO.
St. John, N.B.

HAMPE & HARTWIG,
Hamburg, Germany

Would You Pay



a dollar for a fifteen cent lunch?

Then why pay an extravagant price for sanding your furniture turnings by hand when the NASH No. 10 SANDER can do it so much better and cheaper.

J.M.NASH, Milwaukee, Wis.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.

Choice of this big commercial drying plant is important *because:-*

G. Elias & Bro. - - - Buffalo,
showing their battery of Standard Dry Kilns

[1.] In commercial drying they have to please many customers of varying dispositions.

[2.] Their many customers use many thicknesses and kinds of lumber.

[3.] They have a nation-wide reputation to sustain—so they investigated thoroughly, then they also chose The Standard Dry Kiln. Look over the type in our literature—for copy, address use 1542 McCarty St. Indianapolis, Ind.

The Standard Dry Kiln Co.

W. E. Phillips & Company, Ltd.,
Oshawa, Ontario,

Watt Milling & Feed Company, Ltd.,
Toronto, Ontario,

both decided that there was

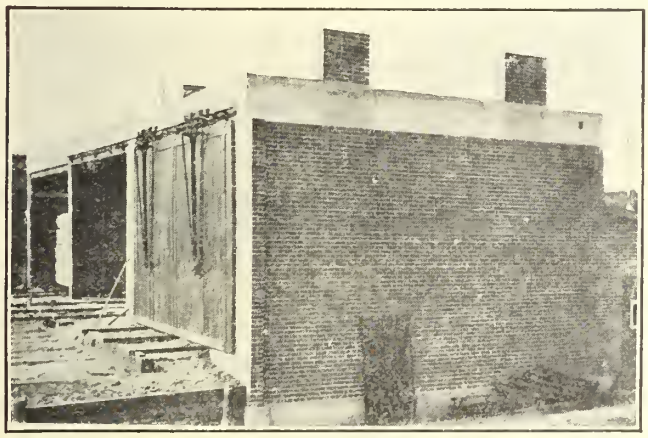
Too Much At Stake

in allowing the human element to assume the whole responsibility of the drying process.

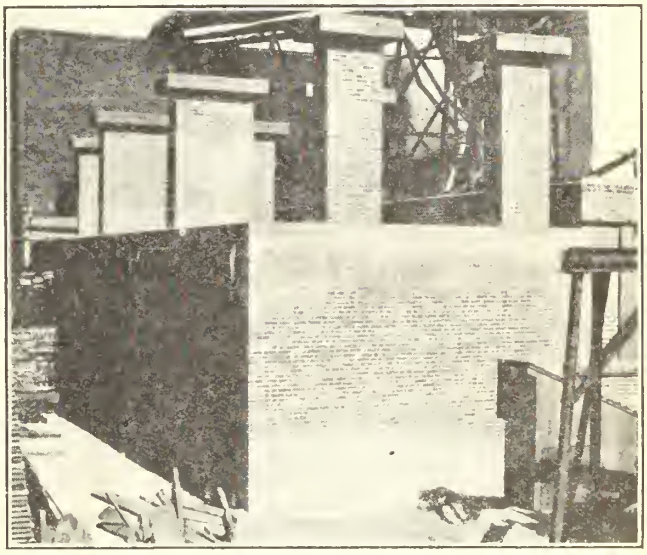
For that reason they equipped their new

National Kilns
with
Automatic Controlling Devices

Continuous mechanical control is now guaranteed three hundred and sixty-five days in the year, whereas, without these devices, periodic control is given only a few hours a day.



Kilns of W. E. Phillips & Co.



Kilns of Watt Milling & Feed Co.

National Automatically Controlled Kilns

will enable you to use the **maximum speed in drying,** for they **automatically** take care of any change in humidity or temperature caused by the reduction of moisture contents of the lumber.

Write for our catalog.

The National Dry Kiln Company

1117 East Maryland Street, Indianapolis, Indiana
C. A. FIELDS, Canadian Representative, P. O. Box 55, Toronto, Ontario

NATIONAL DRY KILNS

Alphabetical List of Advertisers—Continued

Laidlaw Bale-Tie Co. 96
Larson & Shaw Ltd. 25
Litton Veneer Co. 83
Long-Knight Lumber Co. 91
Luehrmann Hardwood Lumber Co. Chas. F. 34

Marietta Paint & Color Co. 74
Mattison Machine Works 112
May Hardwood Co., R. R. 34
Maus, Chas. O. Lumber Co. 34
McDonagh Lumber Co. 46
McKnight & Son Co., L. G. 14
Memphis Bandmill Co. 25
Memphis Veneer & Lumber Co. 85
Mercereau Hawkins Tie Co. 38
Mohawk Veneer Co. 84
Monite Waterproof Glue Co. 19
Morgan Machine Co. 109
Mowbray & Robinson 49

Nash, J. M. 14
National Dry Kiln Co. 15
Nichols & Co., A. S. 79
Nickey Bros. .....
Northwestern Cooperage & Lumber Co. .. 83

Oakey & Sons, John 25
Ober Manufacturing Co. 27
Ohio Veneer Company 83
Oliver Machinery Co. 110
Oriental Textiles Co. 77
Otis Mfg. Co. 45
Overton, S. E. 24

Pannill Door Co. 29
Pedwell Hardwood Lumber Co. 47
Penrod Walnut & Veneer Co. 84
Perkins Glue Co. 17
Pettingell Machine Co. 99
Pickrel Veneer Co. 31
Porter Machinery Co., C. O. 107
Preston Woodworking Mach. Co. 10-11

Radcliff Saw Mfg. Co. 111
Reese-Sheriff Lumber Co. 43
Richards-Wilcox Canadian Co. 99

Shantz, P. E. 30
Shimer Cutter Head Co. 7
Shurley Dietrich Co. 7
Sidmans of Canada, The 95
Simonds Canada Saw Co. 111
Sondheimer Co., E. 47
Standard Dry Kiln Co. 14
Stark & Co., Jas. E. 39
Steele & Hibbard Lumber Co. 39
Stimson & Co., J. V. 40
Stimson Hardwood Co., J. V. 33
Stimson Veneer & Lumber Co. 33
Sturtevant Co., B. F. .....
St. Joseph Iron Works 109

Taylor Mfg. Co., Jas. L. 108
Toronto Blower Co. 4
Toronto Veneer Co. 93
Toronto Hardwood Lumber Co., Ltd. 93

Vandergrift & Morris 46
Veneer Manufacturing Co. 85

Waddell Mfg. Co. 24
Walter & Sons, J. 23
Watertown Table-Slide Co. 41
Willey Co., C. L. 89
Williams Machinery Co., A. R. 6
Williamson Veneer Co. 86
Wisconsin Veneer Co. 83
Wood Mosaic Co. 87
Wylie Mathew 21

Yates Machine Co., Ltd. P. B. 5-29
Yellow Poplar Lumber Co. 48
Young Lumber Co., Bedna 40

Write for "Better Drying in Half the Time" today.

It's the cost of drying per board that counts

THE initial cost and the maintenance of your Kiln equipment, the time required to dry each load and the loss by degrade when the load comes out, must all be recorded in your cost of drying lumber. Cutler Kilns will cut that final figure, sometimes as much as in half for you, just as they are doing for many others today. Fewer kilns, quicker drying and practically no loss gives the Cutler method its lead over other drying methods.

So certain is this result that you owe it to yourself to investigate Cutler Kilns before spending another dollar on kiln equipment new or old. But you don't need to take our word for Cutler savings—we've put the opinions of a dozen Cutler users in a new little book called "Better Drying in Half the Time."

Send for your copy now and let these twelve men who know, tell you the facts. Our planning engineer will then go into your particular problem thoroughly with no obligation on your part.

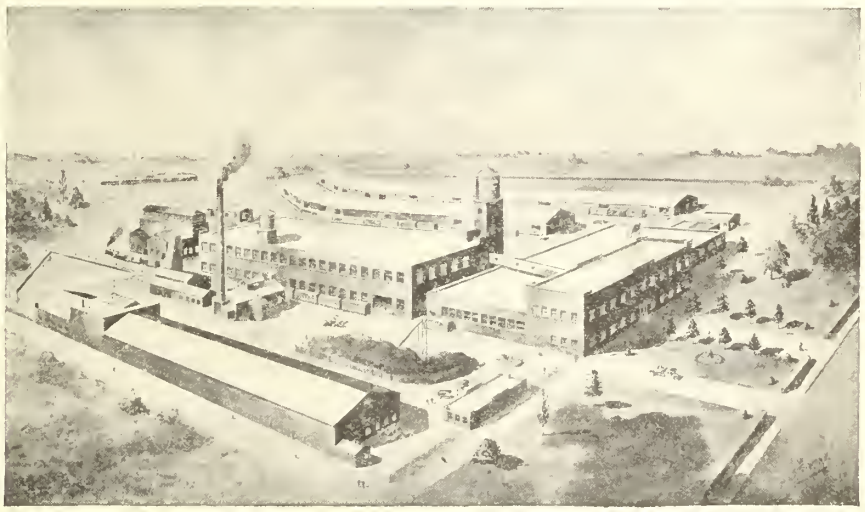
Dry Kiln Department
CUTLER DESK COMPANY
Dept. F. Buffalo N. Y.

All essential features of Cutler Kilns are fully protected by mechanical and process patents, granted and pending.

Cutler KILNS

Better Drying in half the time

PERKINS
1 8 3
Trade Mark
Reg. U.S. Pat. Off.



General Office and Factory

SMOOTH SAILING

WITHOUT INTERRUPTION

the business craft moves smoothly forward when equipped with modern machinery, skilled personnel and high grade raw materials.

By supplying "PERKINS 183" of proved quality promptly we contribute to "SMOOTH SAILING" through your manufacturing problem.

Patents covering Perkins Glue have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy, and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office.
South Bend, Indiana.

"WHAT WE GLUE WE HOLD"

MADE IN CANADA

BY

CANADA GLUE COMPANY

LIMITED

BRANTFORD, ONT.

UNIFORMITY

When used in describing a **Cannon Glue** is more than a claim. It is an established **fact!**

We have customers in Canada who have used one brand for fifteen to twenty years without one cause for complaint.

CANNON CANADIAN CO., LTD.

TORONTO **MONTREAL**

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY

17 State Street NEW YORK CITY

"Casco" for better product

YOUR confidence in your product is shared by your customer when he knows that

Write for "CASCO" Red Book—a manual on Veneers, Panel-making and Glue. Samples of "CASCO" on request.

WATERPROOF GLUE

grips the Veneers or the joints.

"CASCO" is
Incredibly Strong
Mixed in Cold Water
Most Economical

Casco-made woodwork can be subjected to extreme variations in temperature and moisture without fear of separation.

The Casein Manufacturing Company

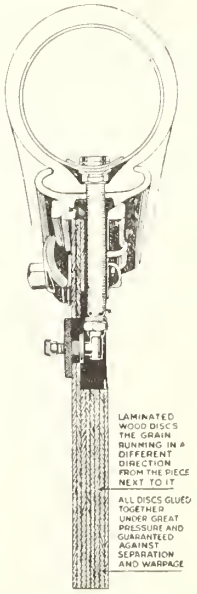
Largest and Longest Established Manufacturers of Casein Products in America : : :

15 PARK ROW, - NEW YORK CITY

Packard Single Six equipped with Dayton Discwood Wheels —and auto disc wheel of plywood, glued with Monite Waterproof Glue.

"DISC WOOD WHEELS"

Monite-Made


LAMINATED WOOD DISCS THE GRAIN RUNNING IN A DIFFERENT DIRECTION FROM THE PIECE NEXT TO IT
ALL DISCS GLUED TOGETHER UNDER GREAT PRESSURE AND GUARANTEED AGAINST SEPARATION AND WARPAGE

"We absolutely guarantee "Dayton Discwood" Wheels against warpage, separation or any imperfection, and we positively agree to replace any wheel broken under any condition if returned to our factory at Dayton, Ohio, for replacement."

The Dayton Automotive Wheel Co., Dayton, O.
(Signed) G. H. GORMAN, Pres.

That "Dayton Discwood" Wheels make good and stay glued is proved by the following quotations from a letter of Billy House, well known racing driver:

"While turning the one-half mile track in 31 seconds she struck a slight wave at the south turn, the result, she jumped the eight-foot embankment, volplaned about forty feet and struck another bank nose on, cut the top of the bank and made a slide of about twenty feet and stopped right side up, no one badly hurt.

"Now for the mystery part of the Dayton Discwood Wheels. After twisting the axle to look very much like a corkscrew, cracking a nickel steel spindle half through, plowing the top of the bank, plus the drop of eight feet at the rate of nearly sixty miles per hour, the inside lamination slightly cracked. We put in new spindles, changed sides and let them ride, and ride they did, they finished the season in grand shape. Every time I look at the wheels, I say to myself, 'If you had been any other than Discwood we would have had a double funeral.'" (Signed) BILLY HOUSE.

Manufacturers who make glued products; dealers who sell, or people who use them, are learning to ask for and expect the service and durability that only **Monite Waterproof Glue** can give.

To give you a clear idea of what MONITE will do, send for our small vest pocket panel of plywood made with Monite Waterproof Glue. Boil, Bake, soak or freeze it—**Monite Sticks to Its Job.**

MONITE WATERPROOF GLUE CO.

Manufacturers of Cold Glue in Powdered Form

1628 North 2nd St., Minneapolis, U.S.A.

Cable Address: Monite—Minneapolis

Canadian Representatives:

W. H. CUNNINGHAM & HILL, LTD., 269 Richmond St., W., TORONTO, CANADA

STOCKS AND REPRESENTATIVES IN ALL PRINCIPAL CITIES.

KANE VEGETABLE GLUE

Our Comebacks are Duplicate Orders

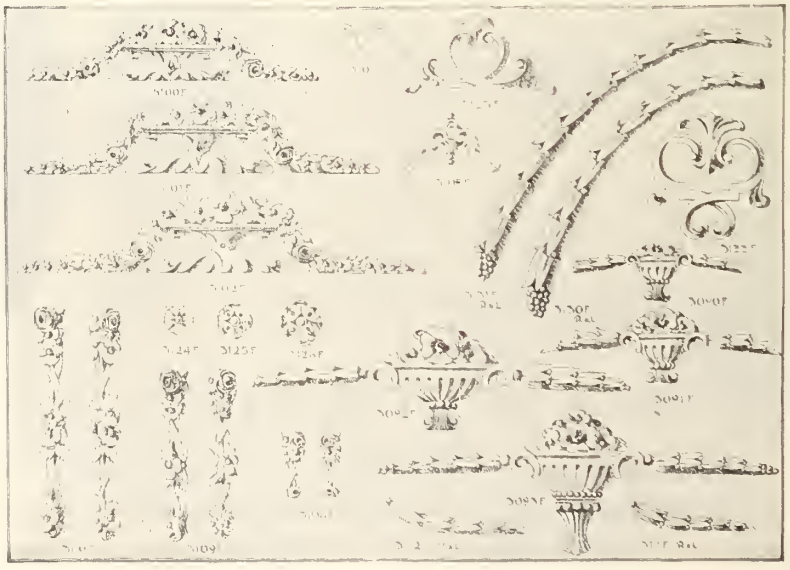
Manufactured by,

KANE MANUFACTURING CO.

1832-34 South Clark Street CHICAGO, ILL.

PERIOD CARVINGS
for FURNITURE

Largest Manufacturers of Imitation Wood Carvings in the World Quality the Best. Prompt Shipments



Unlimited Facilities for Manufacturing High Grade Wood Carvings in Composition and Wood Fibre

Reproductions of Exclusive Designs Our Specialty

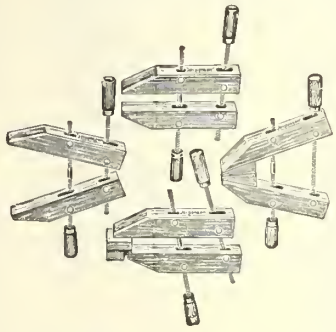
THE DECORATORS SUPPLY CO.

2543 ARCHER AVENUE, CHICAGO

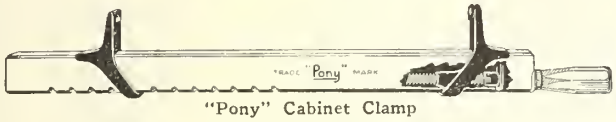
New Catalog Sent on Request

The "JORGENSEN"
Steel Spindle Hand Clamp

10 sizes Adjustable 10 sizes Rigid Jaws



The truth is the "JORGENSEN" is not constructed down to a price but up to a standard—If you need hand screws, why not get the best, and save money, look for the name "JORGENSEN."



"Pony" Cabinet Clamp

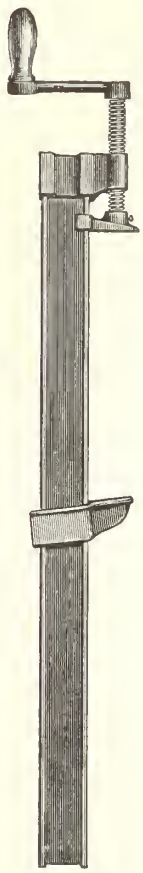
For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.

Manufactured only by the

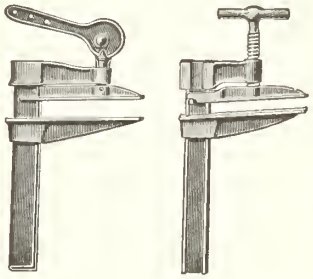
Adjustable Clamp Company
216 N. Jefferson St., Chicago, U.S.A.

For Sale By

Aikenhead Hardware Limited .....Toronto
Lewis Bros., Limited .....Montreal



Colt's Clamps
for the
Woodworker



Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

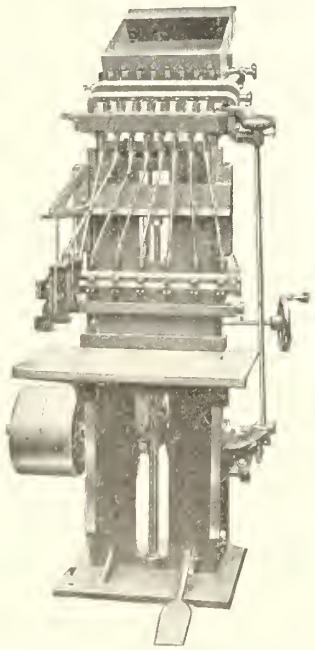
For further information write for Catalogue No. 294.

Batavia Clamp Co.
235 Centre St. BATAVIA, N. Y.

BOX NAILING
AND
CLEATING MACHINE S

ENTIRELY AUTOMATIC

EASILY OPERATED



MACHINES FOR PLAIN

OR ZIGZAG NAILING

THE GUIDING FACTOR IN THE MANUFACTURE OF OUR— MACHINES HAS ALWAYS BEEN QUALITY. THEY ARE BUILT FOR LONG SERVICE.

THERE IS NO NEED TO FIGURE OUT FREIGHT CHARGES, OUR PRICES ARE C.I.F. CANADIAN PORT

ALSO MADE FOR

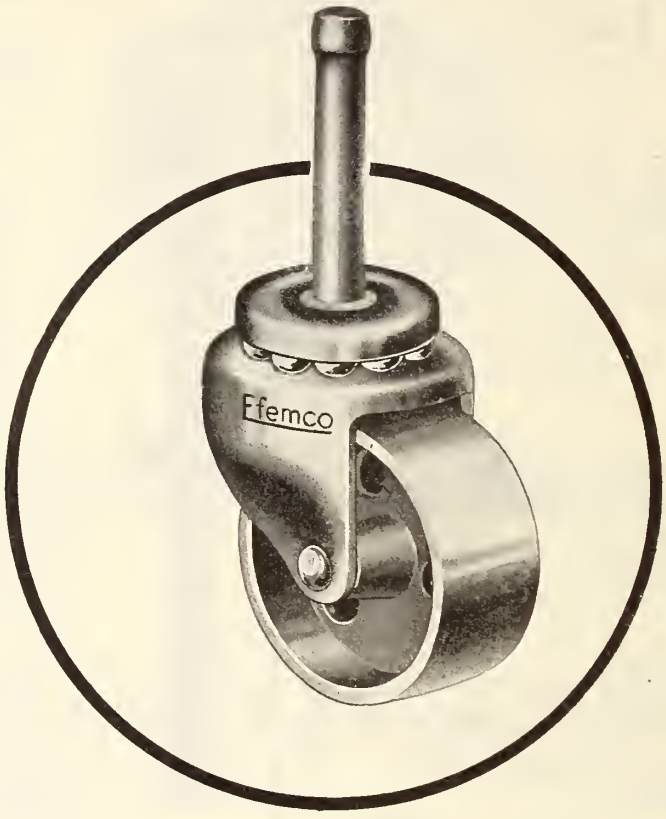
CLEATING or BATTENING

INSTANTLY ADJUSTED

MADE IN ALL SIZES

MAY WE SEND YOU A CATALOGUE?

MATTHEW WYLIE & Co. Ltd.
81 PORTMAN STREET, GLASGOW



Efemco Casters Stand the Test

For instance, the Acme Grip Neck Ball Bearing Caster shown above is typical of sturdy, smooth acting Efemco Casters.

A rugged top keeps the bearings always in place and prevents binding.

Plain, brass-plated or nickel-plated finish. Sizes 3, 4, 5, 6, 7 and 8. With maple, lignum vitae, steel, iron or fibre wheels.

There is an Efemco Caster for every use.

Send for our latest catalog

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters
Roller Bearing Casters

Washing Machine Casters
Truck Casters

Piston Rings
Grey Iron Castings
Automobile Accessories

Standardized by 87 years of service

"The above cut illustrates the result of our co-operation and a customer's idea."

It is our function to develop a high standard in furniture decoration; our business connections justify us in stating that we have succeeded to a to a large extent.

"Made in Canada"

JOHN WALTER & SONS LIMITED

KITCHENER :-: ONTARIO

S.E. OVERTON CO.
"Our Quality Is Always Higher Than Our Price"
ARTISTIC WOOD CARVINGS

WE specialize in the manufacture of high grade wood carvings, wood turnings and specialties.

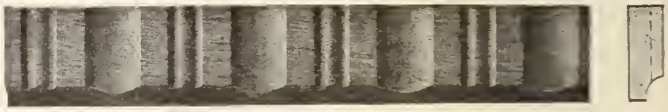
Our highly skilled organization and improved equipment permit us to produce h ighly finished carvings in any quantity, promptly and economically.

Our prices are satisfactory—write for them.

S. E. OVERTON
COMPANY
SOUTH HAVEN
MICHIGAN U.S.A.

CARVED MOULDINGS, CARVINGS, CARVED LEGS

No. D-775 (Reduced One-Half)



No. D-763 (Reduced One-Half)

"KLISE' mouldings are carved, not pressed. Made in several hundred classic, period designs, in various sizes and shapes.
Catalogue of legs and samples of mouldings sent on request. Send us your designs or samples of carvings for quotation.

KLISE MANUFACTURING COMPANY
Grand Rapids, Michigan

M 97

M 88

M 77

M 91

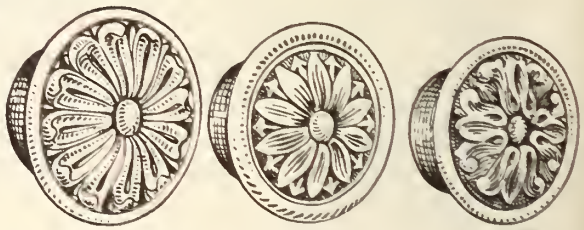
M 72

M 73

MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.



OP8 OP5 OP6

Waddell Manufacturing Company
Coldbrook and Taylor, N. W. Grand Rapids, Mich.

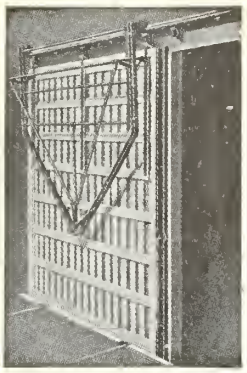
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

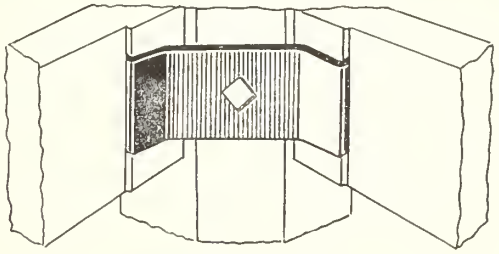
DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

Kasebier Quality
Kiln Dried Bleached

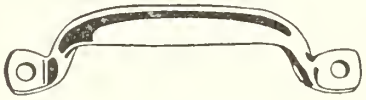
SHELLAC

"Ask the Man Who Uses it"

Kasebier-Chatfield Shellac Co.
No. 7 Cedar St., New York



No. 23 Corner Brace



No. 43Pull

Furniture Trimmings, and Butts Special Hardware

We Also solicit your enquiry for Special Stampings

Larsen & Shaw, Limited
Walkerton, Ontario

OAKEY'S
Glass Paper, Flint Sand Paper, Garnet Paper
IN SHEETS AND ROLLS FOR ALL PURPOSES
Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide
SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers
JOHN OAKEY & SONS LTD.,
WELLINGTON EMERY AND BLACK LEAD MILLS
LONDON, S. E. 1.

Canadian Agents:

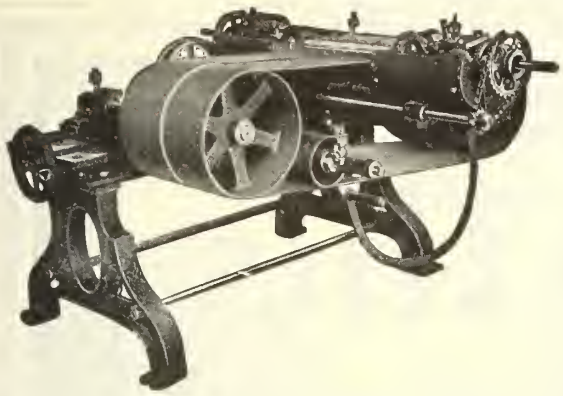
F. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

Furniture World

The Trade Index of Furnishing and Decoration in Canada

Hugh C. MacLean Publications Limited

In January the Furniture and Homefurnishings Merchandiser buys his goods for the Spring of 1923.
The pre-market number of The Furniture World will be read by nearly 3,000 of these subscribers, dealers whose average buying power is many thousands of dollars.
First forms close December 15th, final forms the 26th. Copies are in the mails by January 1st, before the dealer starts for the Mid-Winter Markets.
Our Service Department will help you with copy and layout. Just say the word.
97% of Furniture and allied lines are sold on the recommendation of the retail merchant, in the eyes of the consumers he is responsible.



Give your Broom Handles a nice Smooth Finish and get Highest Prices for them. The "OBER" Automatic Sander will do the work Rapidly and Economically. We build Laths, Sanders, Rip-Saws, Bolters, chucks, Chucking Machines, etc. for making Handles of various kinds, Ball Bats, Whiffletrees, Neck Yokes, Spokes, Golf Shafts, etc.

Write for free catalogue No. 31.

The Ober Mfg. Co.

Chagrin Falls, O., U.S.A.

CLAMP NAILS DO IT

The Radio and Phonograph Cabinet Maker

Internationally known and universally adopted by the leading manufacturers of Radio and Phonograph Cabinets, as the most practical and economical method of mitred joinery.

Samples and circulars on request.

CLAMP NAIL COMPANY

4532 Palmer St. **CHICAGO, U.S.A.**

Quality *from the source*

Thirty Years Ago,

Chapman and Dewey Lumber Company purchased 100,000 acres of Hardwood Timber lands in St. Francis and Poinsette Counties, Arkansas. The selection of this Timber Tract was made after a careful study of Hardwood Stumpage in the South, and the purchase made there primarily, because of the exceptional **Quality** of the Hardwoods growing in this St. Francis Basin. Since that day thirty years ago, St. Francis Basin Hardwoods have acquired a national reputation. Discriminating buyers realize that lumber from this stumpage cannot be excelled for the most exacting requirements of fine wood working.

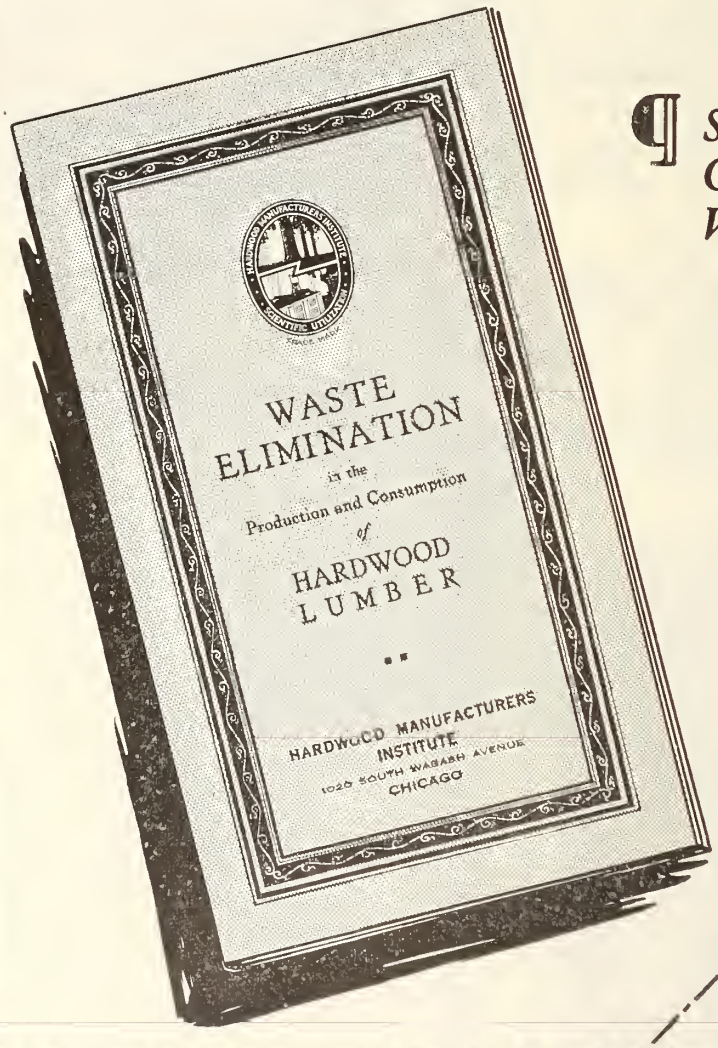
Chapman and Dewey Lumber Co.

940 Bank of Commerce Building

Memphis, Tenn.

Kansas City, Mo. **Marked Tree, Ark.**

Send *for* This *FREE* Book!



¶ *Short*
Concise
Valuable

Detailing a program rapidly being put into effect to save millions.

A saving in which the Consumer, the Producer and the Public will participate.

HARDWOOD MANUFA
INSTITUT
1020 SOUTH WABA
CHIC

Hardwood Manufacturers Institute
1020 South Wabash Ave., Suite 501D
Chicago, Ill.

Date _____

Sirs: Send me _____ copies of your booklet, *Waste Elimination in the Production and Consumption of Hardwood Lumber*, absolutely without obligation of any kind whatsoever.

Name _____

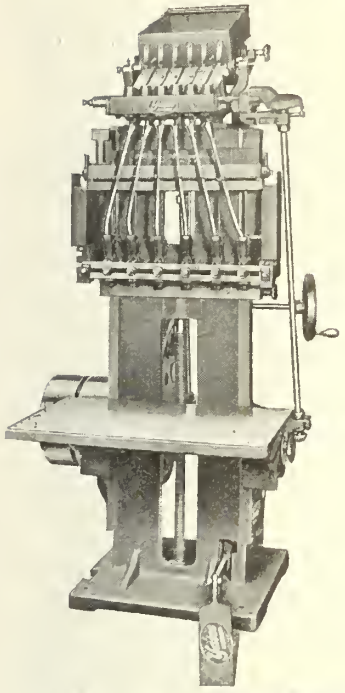
Position _____

Firm Name _____

Street Address _____

City _____ *State* _____

YATES
NAILING MACHINES



Entirely Automatic
Quickly Adjustable—Easily Operated

Give unfailing accurate nailing

One user said:

"There's no question, these machines have certainly increased our output and lowered our manufacturing costs."

We'll be pleased to point out to you the advantages of Nailing Machines and send you circulars describing them.

P. B. Yates Machine Co. Ltd.
Hamilton, Ontario

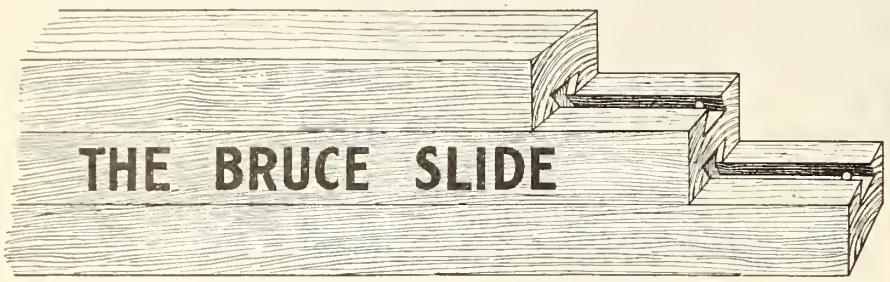
Birch Doors—
Shipped the day you Order Them!

We are the only house in Canada with a ready stock of Birch and Gum doors that can and will be shipped to you the day you order them.
Get our extremely low prices on these doors.

ONE PANEL	FRENCH DOORS
2 - 0 x 6 - 8 x 1¾	2 - 0 x 6 - 8 x 1¾
2 - 2 x 6 - 8 x 1¾	2 - 2 x 6 - 8 x 1¾
2 - 4 x 6 - 8 x 1¾	2 - 4 x 6 - 8 x 1¾
2 - 6 x 6 - 8 x 1¾	2 - 6 x 6 - 8 x 1¾
2 - 8 x 6 - 8 x 1¾	2 - 8 x 6 - 8 x 1¾
2 - 10 x 6 - 10 x 1¾	2 - 10 x 6 - 10 x 1¾

Pannill Door Company Ltd.
131 Front Street East Toronto, Canada
Telephones Main 623-624

TABLE SLIDES TABLE RIMS TABLE PINS



Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

CANADIAN·NASHUA·PAPER·CO·LTD
SERVICE PRODUCT
NASHUA
QUALITY
TRADE MARK
PETERBOROUGH ONT.

Buy Nashua Veneer Tapes
(Paper and Cloth)

QUALITY SUPREME

SERVICE UNEQUALLED

THE CANADIAN NASHUA PAPER CO., Ltd.
Peterborough, Ont.

"The Phillips Line"
Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

Atlas Mfg. Co. of Orlando
Orlando, Fla., U. S. A.

FACTORY TRUCKS

Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY

P. E. SHANTZ, PRESTON, ONTARIO.

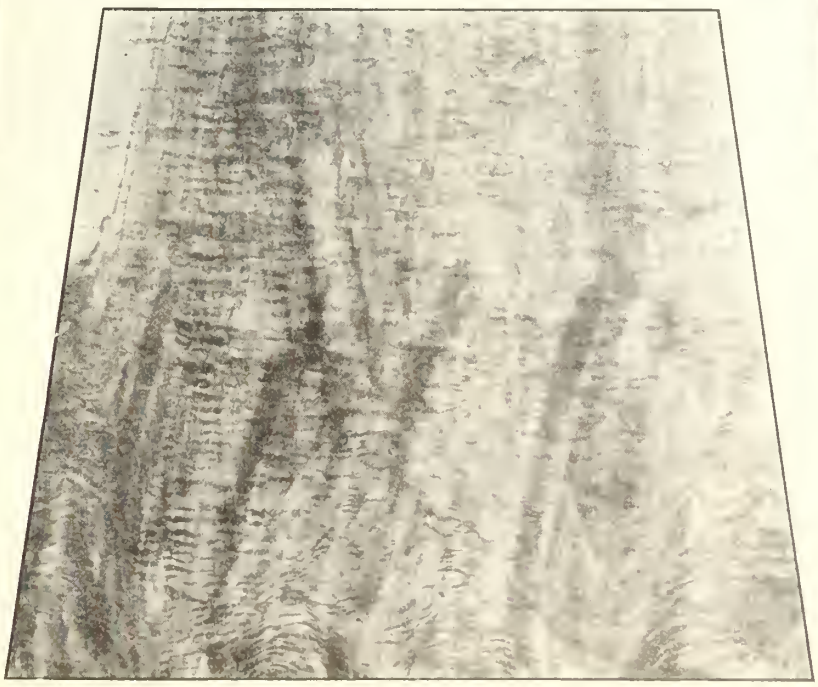
Factory Truck Style No. 26.

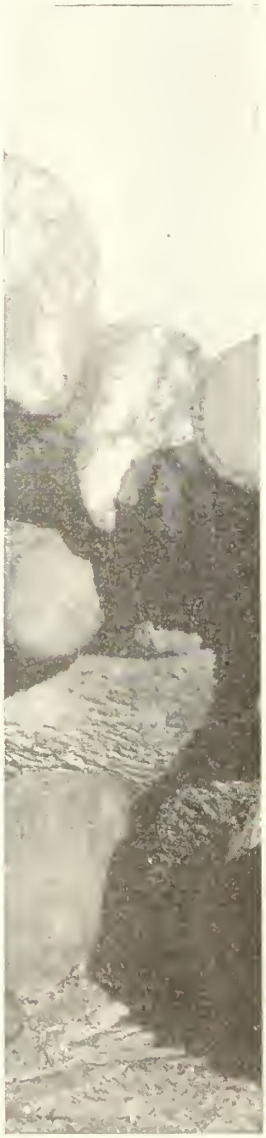
Walnut?—Yes,—Good Walnut?—Yes!
Pickrel

Walnut's sheer beauty, strength, uniformity and permanence brought it in a few years to unquestioned supremacy in furniture construction. Dominance in furniture proves but the beginning. This surpassing merit is every day compelling increased use in new cabinet fields. Pickrel walnut veneers fill an important place in this wider development. A limitless selection of quality veneer logs, careful and skilled manufacture and a constant stock of five million to seven million feet of nicely assorted woods have given Pickrel walnut veneers a special significance. Buyers will appreciate the responsible, conscientious and experienced representation through which Pickrel veneers are offered at their respective plants. It assures the closest possible conformity to the individual requirements of each—meaning less cost in working and a better product.

PICKREL VENEER CO.

New Albany, Indiana





"Better Use Birch"

The Utility of Birch

Marvellously figured, satin textured, close grained and HARD! Birch is coming into its own. The rare beauty and utility of this wood lend themselves admirably to the cabinet-makers' art. Nature builds birch slowly in the tree—and the close knit fibres form a wonderful base for enamel, holding it permanently and resisting dents. The light, natural color also permits of a vast range of stains and finishes. For panels and veneers, Curly Birch is supremely beautiful.

Yet withal Birch is inexpensive, economical and enduring.

The chair illustrated above is a typical example of the beautiful creations being manufactured from Birch.

Anderson, Shreiner & Mawson

HARDWOOD LUMBER
Colonial Building, 13 King Street, West, TORONTO
Mills at King Lake and Eagle Lake, Ontario

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" Fas.
- 5 " 4/4" No. 1 Common.
- 1 " 4/4" No. 2 Common.

PLAIN WHITE OAK
- 2 cars 4/4" Fas.
- 2 " 5/4" No. 1 Com. & Btr.
- 3 " 4/4" No. 1 Com. & Sel.
- 3 " 4/4" No. 2 Common.

QUARTERED RED OAK
- 3 cars 4/4" Fas.
- 6 " 4/4" No. 1 Common.
- 2 " 4/4" No. 2 Common.

PLAIN RED OAK
- 2 cars 4/4" Fas.
- 3 " 5/4" Fas.
- 3 " 6/4" Fas.
- 2 " 8/4" Fas.
- 8 " 4/4" No. 1 Common.
- 2 " 5/4" No. 1 Common.
- 2 " 6/4" No. 1 Common.

QUARTERED RED GUM
- 2 cars 4/4" Fas.
- 2 " 4/4" Fas. Fig.
- 2 " 5/4" Fas.
- 2 " 6/4" Fas.
- 10 " 4/4" No. 1 Common.
- 2 " 5/4" No. 1 Common.
- 2 " 6/4" No. 1 Common.

QUARTERED RED GUM S.N.D.
- 5 cars 5/4" No. 1 Com. & Btr.
- 5 " 6/4" No. 1 Com. & Btr.
- 10 " 8/4" No. 1 Com. & Btr.

ASH
- 4 cars 10/4" No 1 Com. & Btr.
- 2 " 12/4" No. 1 Com. & Btr.
- 1 " 6/4" No. 1 Com. & Btr.
- 2 " 4/4" No. 1 Common.
- 2 " 4/4" No. 2 Common.
- 2 " 5/4" No. 1 Com. & Btr.

SAP GUM
- 8 cars 4/4" Fas.
- 3 " 5/4" Fas.
- 3 " 6/4" Fas.
- 15 " 4/4" No. 1 Common.
- 8 " 4/4" No. 2 Common.
- 5 " 5/4" No. 1 Common.
- 5 " 6/4" No. 1 Common.

COTTONWOOD
- 2 cars 4/4" Fas.
- 6 " 4/4" No. 1 Common.
- 3 " 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 2 " 5/4" Log Run.
- 1 " 8/4" Log Run.
- 6 " 10/4" Log Run.
- 6 " 12/4" Log Run.

Charles O. Maus Lumber Co.

South Bend, Ind., U.S.A.

Southern & Northern Hardwoods

Red Gum (plain or quartered)
Sap Gum (plain or quartered)
Oak (plain or quarter cut)
Ash
Maple
Birch
Southern Elm
Cottonwood
Cypress
Tupelo
Poplar
Walnut
Mahogany

When you think of lumber, think of us.

High Grades Service

NOW is the time to buy.

La Tuque Turpentine

Made by an improved laboratory process from Canadian woods.

An excellent thinner for paste, colors, enamels, stains, paints and varnishes.

La Tuque Turpentine contains no free rosin.

The quality is there
The price is right

Write us for particulars

BROWN CORPORATION
56 St. Peter St., QUEBEC, P.Q.

What would Robinson Crusoe have done without his man Friday?

Won't you let us be your man Friday when it comes to taking care of your lumber requirements? We have a complete stock on our yard and keep in touch with saw mills with unlimited stocks.

Send us your inquiries for straight or mixed cars

R. R. May Hardwood Co.

1522 S. Sixth St. Louisville, Ky.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Ply Wood Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Never Before

have we been so well fitted to give the trade such prompt and careful service and such compelling values. We feel sure that on our first order we can please you in a way that will make you one of our permanent customers.

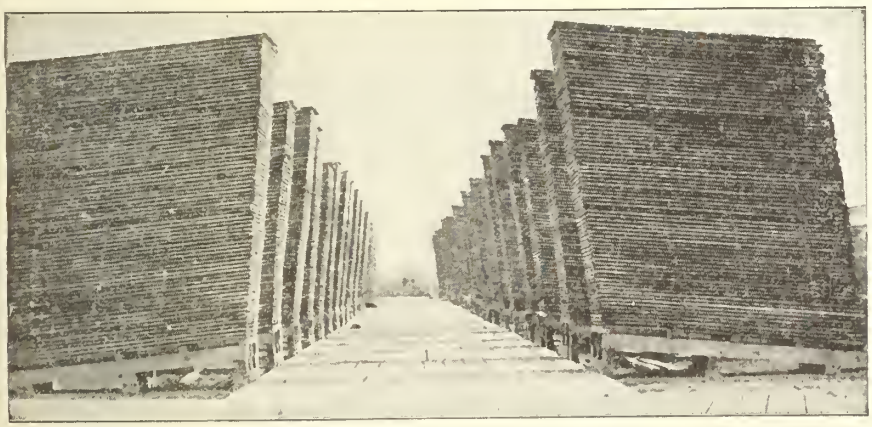
Will you remember us the next time you are in need of Gum, Poplar or Oak?

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY Memphis - Tennessee SERVICE

Efficiency Marks Every Step of Our Service to You



Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

IOWA Walnut

This Modern Walnut Plant is at Your Service

THE picture reproduced above is an actual photograph taken by aeroplane of the plant that produces IOWA WALNUT.

The plant, which covers over seven acres, is devoted to cutting walnut lumber and veneers exclusively. It is equipped with most modern and efficient equipment for the production of quality product.

Only selected logs from trees grown on the deep rich soil of Iowa cornland are used in the product and exceptional care is taken in cutting to bring out every hidden beauty of each log.

Before you buy again let us show you evidence of the quality of the product of this mill and quote you our very reasonable prices on your needs.

Des Moines Sawmill Company
1024 Murphy St., Des Moines, Iowa

Some of the leading American Cabinet Makers select IOWA Walnut for their Finest Pieces. Why not try it?

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

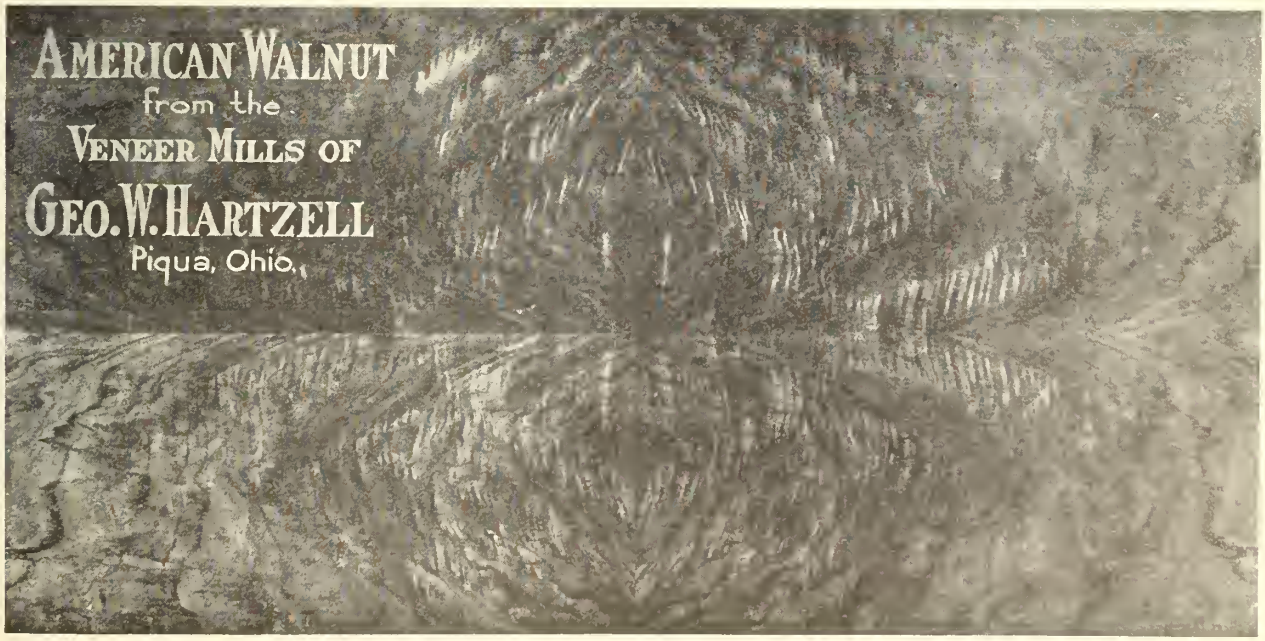
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

Air Dried or Kiln Dried?

Kiln dried stock will mean an advantage to you—a material reduction in weight with a resulting reduction in freight cost. Kiln-drying in our plants means the latest and most improved methods together with efficient handling.

Any of the following items in Southern Hardwoods can be shipped promptly from our band mill at Little Rock, Arkansas. Band sawn in our own mill, dry, good widths and excellent lengths, this stock graded according to National Hardwood Lumber Association rules represents a good value for you.

QUARTERED RED GUM

3	cars	5/4" FAS
1	"	8/4" FAS
1	"	12/4" FAS
3	"	5/4" No. 1 Com. & Sel.
6	"	6/4" No. 1 Com. & Sel.
2	"	8/4" No. 1 Com. & Sel.
½	"	10/4" No. 1 Com. & Sel.

QUARTERED SAP GUM

4	cars	5/4" FAS
1	"	8/4" FAS

QUARTERED WHITE OAK

1	car	4/4 x 10 & wider FAS
1	"	5/4" FAS

QUARTERED FIGURED RED GUM

2	cars	4/4" No. 1 Com. & Sel.

PLAIN RED GUM

½	car	6/4" No. 1 Com. & Sel.

WEIGHTS PER THOUSAND FEET

	Air Dried	Kiln Dried
Oak	4400	4000
Red Gum	3500	3200
Sap Gum	3300	3000

If you do not see just what you want in this list, write us giving your requirements. Our mill is now cutting excellent quality Southern Hardwoods.

E. L. BRUCE COMPANY

MANUFACTURERS

MEMPHIS, TENN.

Band Mill: Little Rock

Oak Flooring Plants: Memphis; Little Rock

Mercereau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

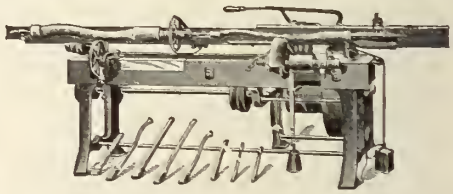
Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

Klotz Machine Co's Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.

We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY

Klotz Machine Co.,
Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good. Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

Steele & Hibbard Lumber Co.
ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

AMERICAN PLYWOOD CORPORATION

GOOD BUSINESS JUDGMENT, is really the foundation of every successful enterprise. Part of this success is due to the wise selection of material. You will make no mistake in selecting our panels for use in all work where panels are required. NONE BETTER. Send us your next order, you are bound to be satisfied.

AMERICAN PLYWOOD CORPORATION
New London, Wisconsin, U.S.A.

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

Lay the Foundation for greater Sales
WITH
BEDNA YOUNG'S
SOUTHERN
HARDWOODS

The quality and appearance of you furniture will be greatly enhanced and its saleability increased by the use of Bedna Young's selected Hardwoods. Don't experiment with unknown lines. Satisfaction always follows an order to Bedna Young.

We are specialists in fine figured quartered oak.

Bedna Young Lumber Co.
Jackson, Tennessee

HARDWOOD PRODUCTS
AND LUMBER

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

J. V. STIMSON
& COMPANY

We offer an unsurpassed service in any of the above woods—straight or mixed carloads. We specialize in soft textured, finely figured, quarterly-sawn red and white oak. Try it.

OWENSBORO - KENTUCKY
Bandmills Owensboro; Campbellsville, Kentucky

DIMENSION

My Specialty is

Dimension Lumber

For Manufacturers of

Wagons and Impliments, Buggies and Autos, Furniture, Railroad Car and Track Material

Standard Sizes on hand for Prompt Shipment. Special Sizes Cut to Order

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN
Office Dimension Mill & Yard
Belt Line at McLean.
MEMPHIS - TENN.

Table Slides Table Slides Table Slides

You have tried the rest, now use the best.

WATERTOWN TABLE - SLIDE COMPANY

Watertown, Wisconsin, U.S.A.

AMERICAN BLACK WALNUT

LUMBER **VENEERS**

OUR SPECIALTY

We are prepared to furnish straight or mixed cars, all grades 3/8″ to 4″ in thickness.

BAND MILL IN DAILY OPERATION

Various items in Quartered White and Red Oak and Cherry.

1/28″. SLICED. WALNUT VENEER especially selected for quality wood and color.

The Kosse, Shoe and Schleyer Co.

Lock Box No. 18 St. Bernard, Cincinnati, Ohio.

Agents in all Furniture Centres.
Offices: Jamestown, N. Y. and Grand Rapids, Mich.
Represented in Chicago, Rockford, Ill., Detroit, Kitchener, Ont., Canada, New York City and San Francisco.

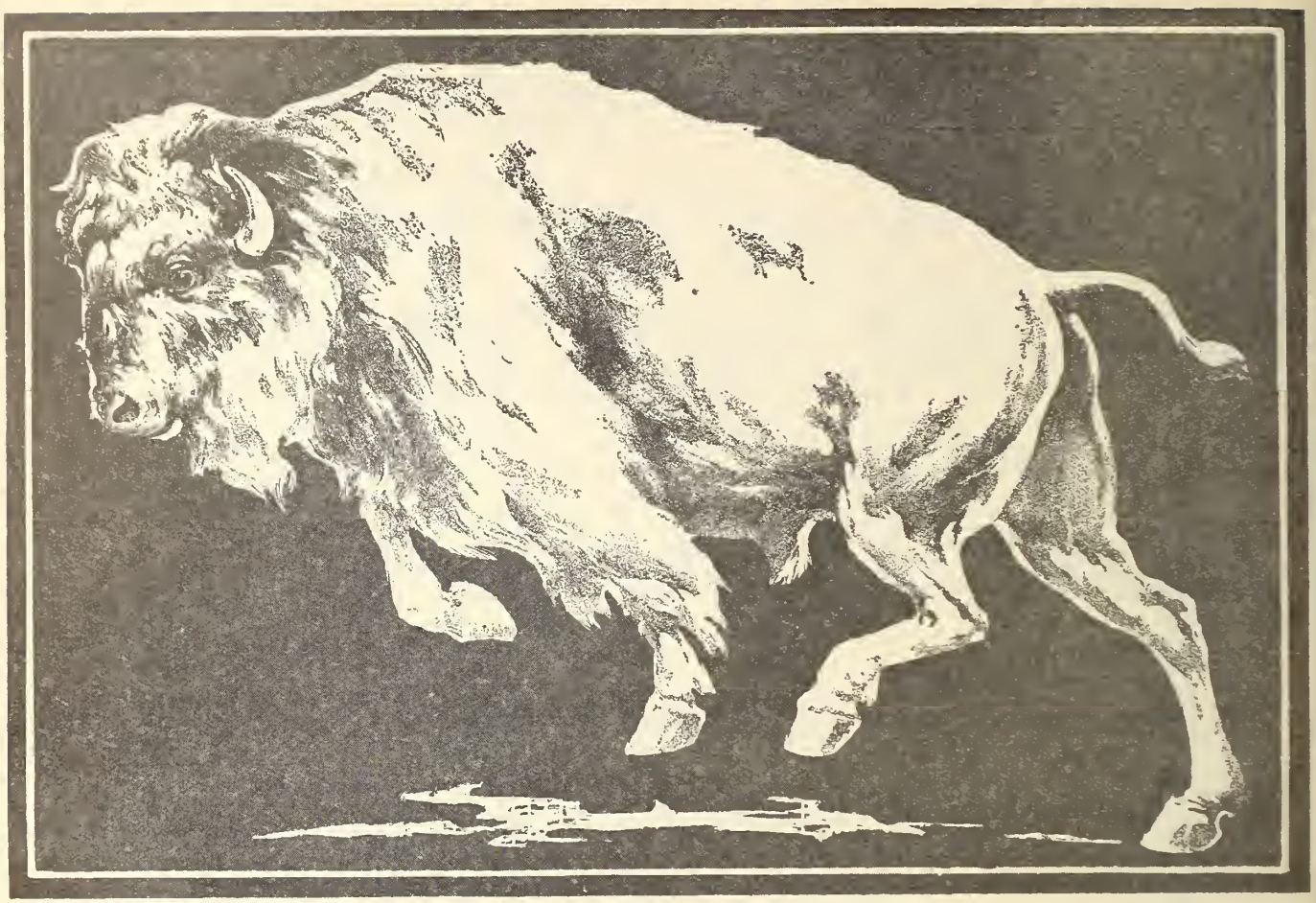
The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated General Office, NEW ORLEANS, U.S.A



T. SULLIVAN & COMPANY
NORTHERN
Gray Elm and Brown Ash
Niagara Street Corner Arthur

BUFFALO *"Buy and Sell Hardwoods in this Market."*
FAMOUS LUMBER CENTER
Unequalled facilities for rapid dispatch, by Rail, Lake or Barge Canal, on all your requirements, large or small.
SUPPLYING THE HARDWOOD NEEDS OF THE NATION

1" to 4 No. 1" Common and 1s & 2s HARD MAPLE
Excellent widths and lengths.
Can kiln dry and surface.
G. Elias & Bro., Inc. Elk Street to the Buffalo River **Buffalo, N. Y.**

YEAGER LUMBER CO., INC.
Our Specialities
Oak Poplar Ash Maple
932 Elk Street

MILLER, STURM & MILLER
Hardwoods of All Kinds
1142 Seneca Street

STANDARD HARDWOOD LUMBER CO.
Hardwoods
Prompt Shipments—from Buffalo Yards or from Mill direct to you
8,000,000 feet Dry Stock on Hand. 1333 Clinton Street

Taylor & Crate **Hardwoods of All Kinds**
A stock of 18,000,000 to 20,000,000 ft. of Hardwoods carried at all times at our big Buffalo yards.
RAIL AND CARGO SHIPMENTS
Established 56 Years
2101 Elmwood Avenue

HUGH McLEAN LUMBER CO.
HARDWOODS OF ALL KINDS
Our Specialties—Quartered White Oak, Plain and Quartered Gum
940 Elk Street

Buffalo Hardwood Lumber Co.
940 Seneca Street
J. B. Wall, Pres't
M. M. Wall, Treas.
T. H. Wall, V-Pres't.
We specialize in—WHITE ASH, OAK AND MAPLE

FRANK T. SULLIVAN
Specialties
Cherry, Walnut and Pacific Coast Woods
Main Office: 600 Ellicott Square. Yard: 2598 Delaware Ave.

ATLANTIC LUMBER COMPANY
HARDWOODS
Our Specialty—West Virginia and Pennsylvania Cherry
West Virginia Soft Red and White Oak. 1055 Seneca Street

BLAKESLEE, PERRIN & DARLING
A complete stock of seasoned Hardwoods
Including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods
White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES—that you can afford to pay
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

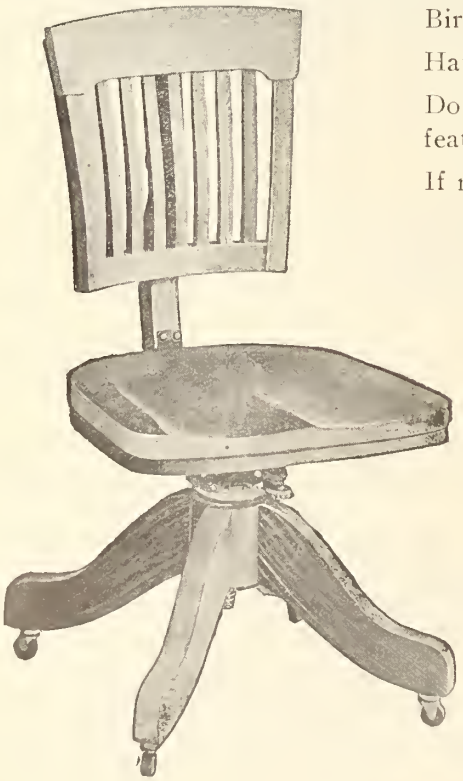
Specialty E C & S *Birch*

Business Needs this type of Furniture

The type of office furniture that immediately creates an "impression" upon the customer or visitor; that is able to withstand the day after day grind and look as good at the end of a year as the day it was bought; that lightens labor and speeds up work—that is the kind of furniture business needs.

In other words, business needs furniture that is economical, efficient and attractive.

And those are just the qualities that a large American manufacturer of office furniture—a client of ours—is building into his products—with the aid of Canadian Birch, supplied by Edward Clark & Sons Ltd.



Have you investigated this super-hardwood yet?

Do you know of its may superior features—features that mean real business for you?

If not let us forward you a few facts.

We have available for immediate shipment a quantity of dry 4/4 Birch, No. 1 and 2 Common. Try a carload. Satisfaction guaranteed.

Edward Clark & Sons Limited

807 Bank of Hamilton Building **Toronto, Canada**

EFFICIENCY *COURTESY* *SERVICE*

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

McDonagh Lumber Co.

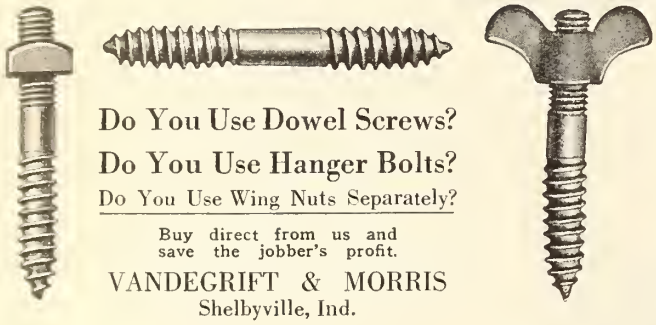
203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods

Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple



Do You Use Dowel Screws?
Do You Use Hanger Bolts?
Do You Use Wing Nuts Separately?

Buy direct from us and save the jobber's profit.

VANDEGRIFT & MORRIS
Shelbyville, Ind.

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co. Limited

ORILLIA, ONTARIO

Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

Ash Poplar Cypress

HAFNER

MANUFACTURING COMPANY

We can Ship promptly from St. Louis practically all items of Oak, Poplar, Gum, Cypress.

ST. LOUIS, MO., U.S.A.

ESTABLISHED 1871

Oak Red Gum

Canadian Hardwoods

Since Feburary 1st we have shipped to one customer 295 cars of hardwood lumber WITHOUT one complaint. We would like to serve you too, may we?

SOME CHOICE 1921 STOCK AVAILABLE

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVENUE - - - TORONTO

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft..... ..3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft..... ..8/4 No. 1 Com

Band-mills at Baton Rouge, La. Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

Mills: Coal Grove, Ohio

CANADIAN ENQUIRIES SOLICITED

General Offices: 33 Rector St. New York City

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.—32,000
1¼ in.— 2,500

CHERRY

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	39,500	8,200	115,900	208,000
1¼ in.	12,500	200	42,600	21,500
1½ in.	15,200	.....	52,700	97,300
2 in.	14,000	.....	33,200	68,900
2½ in.	5,500	.....	4,300	2,200
3 in.	22,700	.....	6,500	5,300
4 in.	4,900	.....	900	400

CHESTNUT

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,500	.....	2,000	.....
1 in.	34,000	500	102,000	15,000
1¼ in.	12,800	100	17,000	33,200
1½ in.	4,500	1,600	49,000	2,500
2 in.	14,200	.....	22,300	12,200
2½ in.	3,000	.....	400	.....
3 in.	1,300	.....	300	500
4 in.	1,500	.....	300	.....

PLAIN RED OAK

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
¾ in.	130,000	255,000	31,800	11,500
⅝ in.	.....	74,000	21,600	2,000
1 in.	66,200	24,000	9,400	50,000
1¼ in.	22,700	15,600	400	1,100
1½ in.	36,900	19,200	700	.....
2 in.	55,500	157,000	47,000	5,000
2¼ in.	1,500	1,400	.....	.....
2½ in.	94,100	33,000	.....	.....
3 in.	8,800	20,500	7,000	12,000
4 in.	2,600	4,900	.....	.....

PLAIN WHITE OAK

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
⅝ in.	.....	7,000	16,900	3,000
¾ in.	125,000	271,000	86,000	38,000
1 in.	66,300	36,000	18,200	105,000
1¼ in.	6,700	1,000	.....	.....
1½ in.	36,300	36,000	.....	.....
2 in.	25,000	69,000	7,000	6,500
2½ in.	118,800	47,500	2,000	1,800
3 in.	18,800	42,800	2,400	600
3½ in.	4,500	5,000	.....	.....
4 in.	27,000	20,500	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
½ in.	6,100	.....	.....	.....
¾ in.	3,900	.....	5,600	3,000
⅝ in.	2,800	.....	700	800
1 in.	41,300	300	4,400	200
1¼ in.	11,000	200	5,000	500
1½ in.	10,000	.....	2,500	.....
2 in.	8,000	.....	24,100	5,700
2½ in.	1,000	.....	400	.....
3 in.	.....	.....	700	.....
4 in.	2,500	.....	1,700	.....

POPLAR

	Stained Saps	No. 1 Com.	No. 2 Com.	No. 3 Com.
¾ in.	.....	9,000	.....	.....
⅝ in.	12,000	26,300	1,800	.....
1 in.	19,000	75,900	8,800	11,000
1¼ in.	13,000	30,700	5,000	.....
1½ in.	2,700	12,000	22,500	8,000
2 in.	15,422	14,400	7,500	.....
2½ in.	3,700	15,800	600	.....
3 in.	5,400	2,900	31,000	9,000
4 in.	1,900	6,300	200	.....

QUARTERED RED OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,700	.....	5,700	500
1 in.	6,200	5,400	2,500	1,400
1¼ in.	5,900	.....	900	.....
1½ in.	.....	.....	.....	.....
2 in.	.....	.....	7,400	.....

PLAIN RED GUM

	1 x 2	No. 1C	No. 2C
1 in.	38,300	15,900	.....
1¼ in.	18,000	7,325	1,800
1½ in.	30,000	61,300	15,500
2 in.	4,000	200	11,500

SAP GUM

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
1 in.	.....	400	.....	.....
1¼ in.	.....	200	2,000	9,000
1½ in.	5,400	11,000	13,500	2,500
2 in.	5,100	.....	.....	18,800
3 in.	.....	.....	.....	300

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	1,800	.....
5/4	.....	14,000	.....
8/4	.....	15,500	.....
10/4	.....	10,250	15,000	1,800
12/4	.....	3,500	4,000	300

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	18,000	16,000	.....
5/4	.....	18,400	22,800	200
6/4	.....	29,900	50,500	5,600
8/4	.....	44,300	.....	12,000
10/4	.....	2,000	3,000	.....

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y.

Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

WALNUT

All thicknesses and grades
Can make immediate shipments
Our stock and prices will please you
Send us your inquiries

Canadian Representative
A. E. KLIPPERT
11 Laxton Ave.
Toronto, Ontario

LELAND G. BANNING
Cincinnati, - - Ohio.

OAK

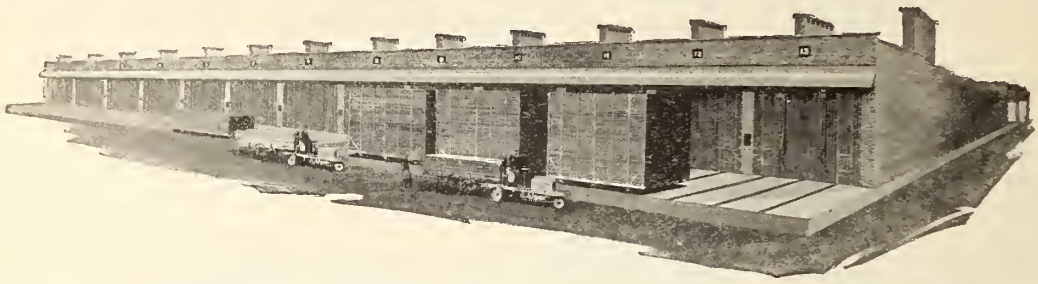
Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash and other Hardwoods

Oak Timbers and Planking

THE MOWBRAY & ROBINSON LUMBER CO.
Office: CINCINNATI, OHIO
Canadian Representative:
A. K. Johnson, Bank of Hamilton Bldg, Toronto, Ont.

KILN DRIED HARDWOODS



Kiln capacity 3,000,000 ft. monthly

WEST VIRGINIA
OAK
CHESTNUT
WHITEWOOD
BIRCH
HICKORY

We earnestly solicit your inquiries

AROMATIC RED CEDAR

ARKANSAS
RED GUM
SAP GUM
OAK
ASH
ELM

The M. B. Farrin Lumber Co.

CINCINNATI, OHIO

Dependable Shippers of American Hardwoods

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars

All Canadian and American Hardwoods

Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO

Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.

Subscription, Canada, Great Britain and British Possessions $2.00; United States $2.50; other Foreign Countries $2.00. Single Copies 15 Cents.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 Toronto, November, 1922 No. 11

Production Decreased by Unhealthy Shop Conditions

Woodworking has been regarded generally as relatively free from those disagreeable and devitalizing diseases that seem to be so inseparably associated with many other industrial occupations. The mining, the iron and steel and the packing industries, for example, have been considered to involve hazards from a disease point of view that are of more or less harmful proportions, depending on the degree to which the workers are exposed to them. That it is possible for these so-called occupational diseases to be serious in the extreme is well illustrated by the fear with which, not many years ago, workers labored in the match factories. There, certain operations, involving the use of poisonous chemicals, so undermined the physique and vitiated the blood that death crept slowly but surely upon the unfortunate toiler whose lot it was to earn his living under these circumstances. Today such conditions are rarely met with, thanks to the power and advance of industrial hygiene which is constantly seeking to alleviate the sickness hazards that surround industrial occupations. And yet, in many industries and in many individual plants, workers are being unnecessarily subjected to such disease-inducing and health-undermining surroundings that they are as slowly but as surely dying as did the match workers of a few years ago, with this exception only that those match workers knew beforehand the fate that awaited them while today's toilers are generally unaware of the hazards or being aware of them, do not expect them to be of serious consequence. However, the statistics, which many investigators have compiled, relating to industries in which occupational diseases are known to be prevalent, show just how very disastrous and serious they are, not alone in actual sickness but also in the diminished capacity for work among those exposed to the hazards and in the consequent loss of production.

Woodworking, while certainly not one of the most hazardous industries from this point of view, is, nevertheless, fraught with certain dangers that make it well for operators and managers to analyze the conditions under which their plants are operating. To show the hazards to which woodworkers are exposed, an article by J. F. Rogers, written at the editor's request, is published elsewhere in this issue. It is a concise yet thorough consideration of the problem of health in the woodworking industry. It is hoped that more will be printed on this topic so that proper emphasis may be given to a matter that has a very serious effect on production. Indeed, there is a possibility that government bodies in Canada will endeavor to investigate thoroughly, the whole industry from an occupational disease standpoint. If such an official investigation develops it is hoped that the operators of woodworking plants will render every possible assistance in the matter of gathering figures and statistics, of which at the present time there are all too few.

An Analysis of Costs in the Millwork Industry

Most of the readers of the "Canadian Woodworker" will be much interested in the chart which appears on page 55 of this issue. It represents a graphic analysis of costs prepared by the Millwork Cost Bureau of Chicago, that organization that is doing such excellent work in putting cost-keeping and estimating in the woodworking industry on a substantial basis. This Bureau has undoubtedly gone to a great deal of trouble to collect and compile the figures that form the basis of the diagram referred to, but the results will be worth while if millmen will take the opportunity of studying the contents of the diagram and the explanatory comment which accompanies it. While the chart as reproduced in the "Canadian Woodworker," was somewhat amended from its original form, for reproduction purposes, copies of it in the shape gotten out by the Millwork Cost Bureau may be obtained from that organization gratis. This offer is extended to any millwork organization irrespective of whether they are members of the Bureau or not. Incidentally, the fact that the service is not confined to members only shows a splendid spirit of co-operation and service to the whole woodworking industry.

It is not the intention of this comment to trespass on the lengthier article that appears in connection with the chart, but just to emphasize its importance and draw our readers' attention to it. Briefly it represents an analysis of the operating costs of 13 representative millwork plants. Their material, labor and burden factors are all indicated in terms of dollars and also percentages. In each instance the figures were taken from reports of actual cost surveys conducted by Bureau accountants, and hence whatever was material, labor or burden in one establishment is material, labor or burden in each. The chart graphically portrays the fact that no two plants operate similarly and that, therefore, there is considerable variation in the proportions of the three basic cost factors. How the nature of the business carried out by each plant affects the proportion of these factors is carefully explained in the article. One of the impressive points of the analysis is that the 13 firms show an aggregate burden equivalent to 29% of the total cost which is much more than the average labor factor of all plants, or, for that matter, of any indi-

vidual plant. Incidentally, we emphasize the importance of the burden factor and urge that it be determined on a proper basis. In this connection the Millwork Cost Bureau's standard plan of burden calculation seems the only correct and logical medium for burden expression.

In analyzing the chart our readers are reminded that the rates shown must not be considered as representative of the industry as a whole. They are simply individual experiences.

Nine Rules for Material Handling

Nine rules that apply to material handling problems and the selection of material handling equipment are given by W. T. Spivey in Factory. (1) Know every kind of equipment on the market. A haphazard selection of equipment which will do the job only reasonably well is a poor investment in the long run. (2) Analyze material routing carefully. The relation between the elements in a material handling system is, in many cases, more important than the design of the equipment itself. (3) Visualize the job's actual needs. No, two plants have exactly the same problem. While the same principles apply in most cases, careful study of individual requirements pays well. (4) Buy for an operating saving, not for first cost. The man who buys on price alone doesn't always get what he thinks he does. Correct engineering analysis, a good machine, and subsequent service are worth a fair price. (5) Get together with the designer and the manufacturer. Doubtless there is much equipment manufactured which is not ordinarily known. How to select the best machine adopted to particular needs is a matter of engineering judgment gained through the experience of successful installations in other plants. (6) Lay out the equipment when the building is planned. A building is best planned with both eyes on economical manufacturing. Material conveying machines are the links which join other machines into unit production. (7) Re-arrange equipment systematically. A different product or a different operation sometimes requires an entirely different application of the machine. Many a "patch-work" job has been done without thoughtful planning. (Teach the operator the possibilities of his equipment. The science of material handling is a new one. Like the lathe, drill press, or milling machine operator, the man who runs the conveying machine will do a more effective job if he knows what it is all about. (9) Maintain conveyors as carefully as production machinery . Lift trucks, gravity conveyors, tiering machines, and so forth, are more than mere wheel-barrows. Each represents an investment and a heavy depreciation makes the investment a poor one.

Co-Operation—Putting a Little in and Getting a Lot Out

A ragged and dejected stranger was observed one day walking down the middle of the main street of a bedraggled village. He looked neither to the right nor to the left, but kept his eyes on the road in front of him.

When he arrived at what seemed the biggest section, he stooped down and picked up a stone, examined it carefully and with a wild cry of delight threw his tattered hat into the air and danced around with great glee.

A crowd gathered and the vagabond was asked the cause for his jubilation. "Cause enough," he replied, "this,"—holding up the stone that all might see it—"is the great soup stone for which I have been searching all over the world." And again he gave vent to his paroxysm of joy. The onlookers were now very curious and the tramp was forced by many questions to explain what the stone was good for.

He quickly called for a kettle of water that he might demonstrate the wonderful power of the soup stone. A great copper kettle was produced and somebody brought the wood for a fire and someone else brought the water. The fire was soon made and the water boiling.

Then, in hushed expectancy, the stone was tossed in. As the bubbles rushed to the top the stranger pointed to the grocery store and said: "It would make it better if we had that head of cabbage"—and as it was produced—"That's right, throw it in." A farmer's wagon stood nearby with a carrot or two visible on the bed. "There's a carrot—say! just hand that over—and—Can't you get a bone from the butcher?"

So it went. The pot boiled merrily and the stranger under the excitement of the moment got first one ingredient and then another until a fine kettle of soup was done. Then dippers were procured and everybody was given a generous helping.

But a canny old farmer, after tasting of the soup, said: "Why, this fellow is a fake. That stone he found ain't got nothin' to do with the soup. Everything he put in it we furnished."

Turning to the skeptic, the stranger said: "My good man, what did you put into the soup?"

The farmer replied, "Why, that's my wagon over yonder that you got the carrot out of."

"Well! Well!" rejoined our friend, "you put in a carrot and you get back a bowl of soup—your little donation brings you a share of what everybody else contributed. You put in a little and you get back much. That is co-operation."

The Effects of Good Lighting

A factory illumination authority has said that a factory whose lighting equipment has not been relamped within the past five years, is obsolete. In connection with lighting, the factory manager must consider three things: the window illumination, the electric units for artificial lighting and the factory decoration. The effects of good lighting, of bright and cheery surroundings in the work room includes:

1. Better working conditions,
2. Increased production,
3. Greater accuracy in workmanship,
4. Less spoilage,
5. Reduced bills for lighting,
6. Neatness and Sanitation of plant,
7. Less eye-strain,
8. Reduction of accidents,
9. Improved morale among employees,
10. Reduction in labor turnover.

If one neglects one of the three essentials, the chance of securing all the ten resultants, are greatly reduced.

The Pulitzer interests of the New York World, which own the controlling interest in the pulp mill in St. George, N. B., are understood to be contemplating the erection of a woodworking mill adjacent to the pulp mill if it can be shown that the cost of power from the Musquash hydro station will be cheap.

Is Woodworking a Healthy Occupation?

The Dust Developed During Woodworking Operations Has a Serious Effect on the Workers and by Decreasing Their Physical Powers Reacts on Their Productiveness—How to Combat Occupational Diseases

By James F. Rogers*

Workers with wood, from those who fell trees to those who produce finished products of all kinds, are very subject to accidents from machinery, from flying pieces of wood and from edge tools. The woodworker has, however, been looked upon as relatively free from disease attributable to his occupation and at first glance the seeming cleanliness of his work would tend to allay suspicion. Many of the processes are, however, dusty and while wood dust is certainly not so injurious as that from some other materials, its inhalation is not a normal, physiological process and the presence of this foreign substance in large amount might be expected to have some deleterious effect upon the respiratory organs. Dust from hardwoods, on account of its smaller size and its hardness, is relatively more irritating. Rattan contains a considerable amount of silicious material and silica dust has, for a long time, been known to be highly injurious to the lungs, and where sandpaper or sanding belts are used silica always forms a part of the dust breathed by the worker. As illustrative of the irritative effects of this mixture of organic and inorganic dusts, R. Prosser White, (Occupational Affections of the Skin, 1920, page 101) says: "Sandpapering hardwoods, e.g., ash, in wood turning shops fills the room with fine dust. After a holiday both new and old hands experience all the symptoms of coryza, for the first two or three weeks, from the hard particles irritating the eyes, nose and throat."

Extent of Sickness Among Woodworkers

In a study of 5,341 cases of illness among 10,171 wood-workers in Vienna in 1904 Sternberg (Weyl's Handbuch der Arbeiterkrankheiten, 1908, page 432) found that 28.1 per cent were suffering from tuberculosis or some other form of disease of the respiratory organs, and according to Roth (Gewerbekrankheiten, Berlin, 1909, page 190) 61.7 per cent of all the deaths among wood turners in Berlin for seven years were caused by consumption. A high percentage of sickness was found among wood-workers of Alsace, and Neisser in a wooden tool factory in Strassberg found that fifteen out of twenty workmen were sick during one year (1904), chiefly from respiratory diseases, with a total loss of 288 days from work. Neisser, Internat. "Ubersicht u." Gewerbehyg., 1907, page 115).

Sir Thomas Oliver (Dangerous Trades, page 135) has pointed out that the mortality from tuberculosis and from other respiratory diseases among coopers and wood turners of Great Britian was more than duble that for agricultural workers.

Robinson and Wilson of the U. S. Public Health Service (Public Health Bulletin No. 73, 1916) examined two hundred and seventy-three wood-workers in three factories in Cincinnati, the greater part of the men being coopers and bung makers. Seven cases of tuberculosis were found with a percentage of 2.56. These factories had installed blowers but they "were not always successful in eliminating the dust." No thorough going study of the subject, such as it deserves, has as yet been made in this country.

While the dust from most woods probably acts as a mechanical irritant, that from some of the less common woods produces definite symptoms of poisoning. According to Oliver (Dangerous Trades, page 791) workers with Sequoia wood may suffer from symptoms of an acute cold in the head and may even have difficulty in breathing and a sense of oppression in the region of the stomach. "A kind of tolerance comes in time to be established, although in cases of men who are subjects of asthma and throat affections their experience is painful and the effects enduring." The following woods are said to have an irritating effect upon the skin: African ebony, magenta rosewood, West Indian boxwood, cocus wood, partridge wood, olive wood, Mexican blue gum and teak wood. Thompson (Occupational Diseases, page 448) says that the dust from teak wood "may give rise to nausea, vomiting and other constitutional symptoms," while that from boxwood may cause "depression of the heart and general muscular weakness."

In woodworking factories the continuous noise from saws and planing machines has a disastrous effect upon the hearing of the men, the workers about drying kilns are subject to high temperatures and in the finishing of woodwork with bleaches, stains and polishes the workers are often exposed to highly poisonous substances. As these latter processes do not belong to woodworking proper they will not be discussed here.

Dust the Outstanding Menace

Dust is evidently the outstanding menace to health of the wood-worker, and, from the figures quoted from the foreign investigators, it is of serious consequence. Along with actual disease there must be also diminished capacity for work among many who do not show definite symptoms. This reduced capacity for work as well as the possible development of disease from this cause should lead the factory manager to install effective means of removing dust.

Aside from any specific conditions of the trade which may be harmful to the health of the worker, the ventilation, lighting, seating, water supplies, sanitary arrangements, and not least, the mental and physical fitness for the job deserve to be looked into, for all these things make for the well-being of the worker and react on his productiveness.

A thorough physical and mental examination should be given at entrance, and at regular intervals and the man placed in the job for which he is mentally and physically best adapted. The keeping of accurate sickness records may be a help in tracing the effect of work and conditions of work. While we are taking great pains to prevent cuts and bruises and broken bones, it will pay to prevent the more insidious and usually more serious accident of disease which reduces capacity for present work and shortens the time of future usefulness.

*Acting Assistant Surgeon, U.S. Public Health Service.

How Are Millwork Costs Distributed?

A Graphic Analysis of the Operations of Thirteen Plants Shows Considerable Variation in the Proportions of the Three Basic Cost Factors, Material, Labor and Burden—What Such an Analysis Teaches

By the Millwork Cost Bureau, Chicago

Millwork operators frequently inquire, "What portion of my annual costs should be labor," or, "Considering a year's operation, what are the proper percentages of material, labor and overhead that make up the total cost of an average millwork plant?, etc., etc.

No one familiar with the cost problem of the millwork industry would attempt to answer such a query, because in this trade there exists no standard of comparison of the kind mentioned. Just what is an "average millwork plant?" Is it the one that occupies the position of a necessary evil in the transactions of some retail yard? Would it be the plant that manufactures its entire line of merchandise and does no jobbing to speak of, or is it the establishment that tries to job everything and manufactures only what it must? Then there are also what are strictly sash and door mills producing nothing but stock items, veneered door specialists manufacturing both stock and special work, trim and flooring factories, frame shops, stair builders, cabinet makers, and column manufacturers. All fall under the nomenclature of millwork—they are similar in many respects and dissimilar in just as many more. Their physical properties, land, buildings, equipment, and layout are vastly different. At the present time, wage rates range from 30 cents an hour in one market to something in excess of $1.00 an hour in another. The kinds and grades of lumber that predominate in this or that institution are just as variable. Viewing the situation in that light leads one to conclude that an "average millwork plant" is non-existent.

The accompanying graphic chart portrays this lack of operating similarity and subsequent variation in the proportions of the three basic cost factors —material, labor, and burden (or overhead)—in most forceful fashion. None of the thirteen firms charted was selected for analysis because of its physical properties, but it was attempted to make the chart geographically representative, and therefore no two plants in the same city, or, where it was possible, in the same state, were used. Aside from that there was no discrimination. The cost figures in each instance were taken from the reports of actual cost surveys conducted by Bureau accountants; hence they are uniformly arrived at, and whatever was material, labor, or burden in one establishment, is material, labor, or burden in each. Because of the large sums involved, it was necessary to depict all costs in round numbers, but in every other respect the chart conforms to the actual figures.

Significance of "Material" and "Labor"

The term "material" signifies direct material; that is, such material as may be traced directly to this or that job or order. Brads, screws, etc., are considered Bench Burden, unless used on power-driven machinery, in which case they would be classed Machine Burden. There are some materials which, while they may be traced directly to a specific order, would by so doing involve lengthy or cumbersome calculations, for which reason they are placed in the "indirect" class and become a portion of the factory burdens. Direct material is divided into two groups; viz., lumber, which requires no explanation, and other direct material, which is composed of such items as glass, mirrors, veneers, hardware, and any millwork purchased outside, whether it be fully assembled or in various uncompleted stages of fabrication. In case a retail yard is operated in connection with the mill, such items as flooring, roofing, building papers, and the like, are grouped with Other Direct Material, and the rough lumber—boards, dimensions, timbers, etc. —for burden purposes, is grouped with the factory lumber.

By "Labor" is meant direct or productive Labor. Like direct material it consists only of such costs as are occasioned by a specific order. Supervision, equipment or building repair labor, trucking (both motor and hand-power), powerhouse labor unloading labor, delivery, shipping and warehouse labor, selling, billing, etc., are all Indirect—it is impossible or impractical to charge them against a given job; hence they are distributed to one of the burden units.

What is Involved in Burden

All cost or expense that is neither Direct Labor nor Direct Material by that token is Burden. The M.C.B. Burden Plan involves five distinct rates; to wit:

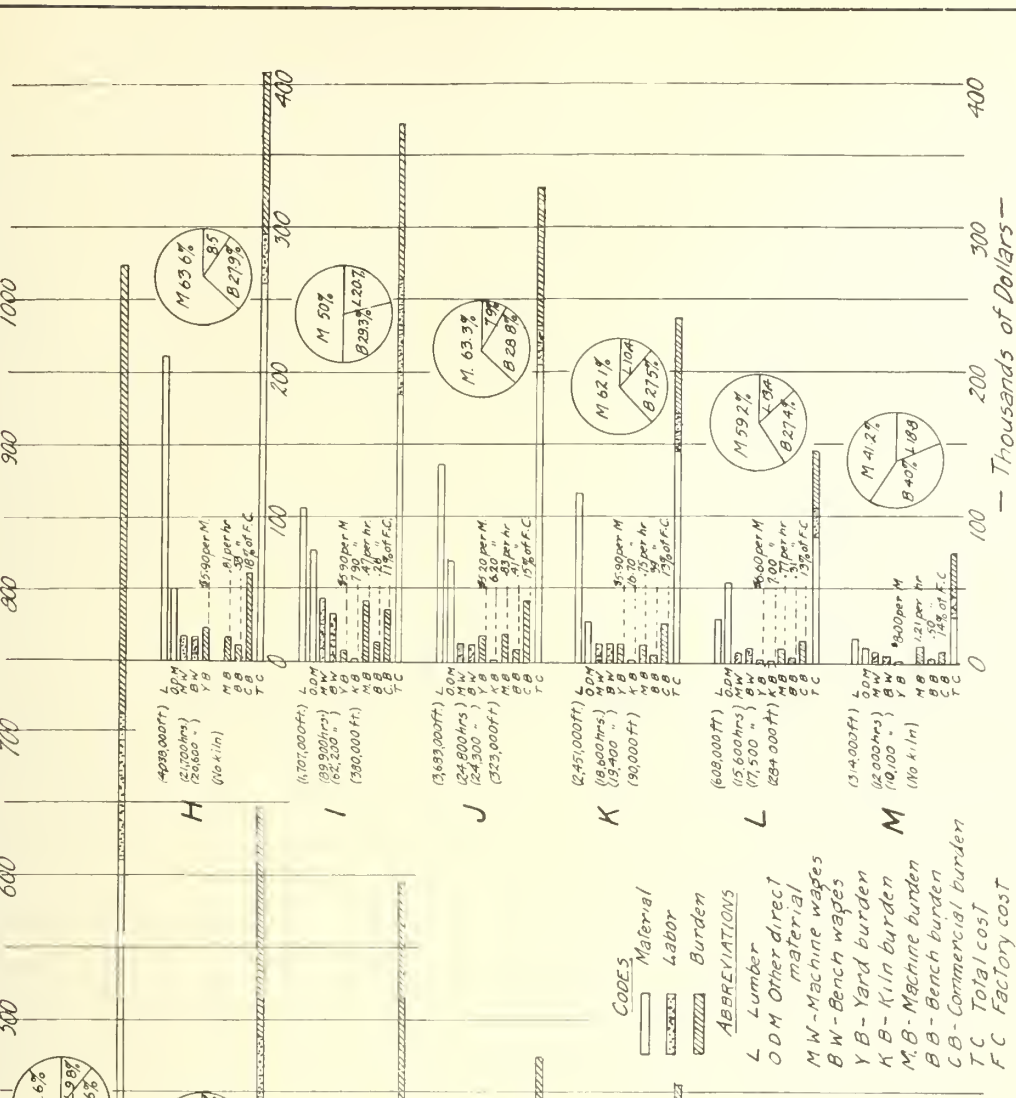
1. **Yard Burden,** which embraces all cost of handling and carrying lumber from the moment of its receipt until entry to the mill or, if not worked, until taken over by the delivery crew. This burden is expressed as a flat rate (dollars and cents) per thousand board feet consumed.

2. **Kiln Burden,** which is composed of all cost incident to drying in the kilns. It is expressed as a flat rate (dollars and cents) per thousand board feet dried.

3. **Machine Burden** is all cost—exclusive of direct workmen's wages—of operating the machine equipment and housing it and the workmen. It is expressed as a flat rate per direct man-hour.

4. **Bench Burden** is all cost—exclusive of direct workmen's wages—of operating the bench department and housing the equipment and workmen. It also is expressed as a flat rate per direct man-hour. Where a crew of painters and finishers are steadily employed for filling, staining, shellacing, etc., a Finishing Burden per direct man-hour should be established. However, in the absence of a sufficient volume of such work, finishing is considered simply as bench work.

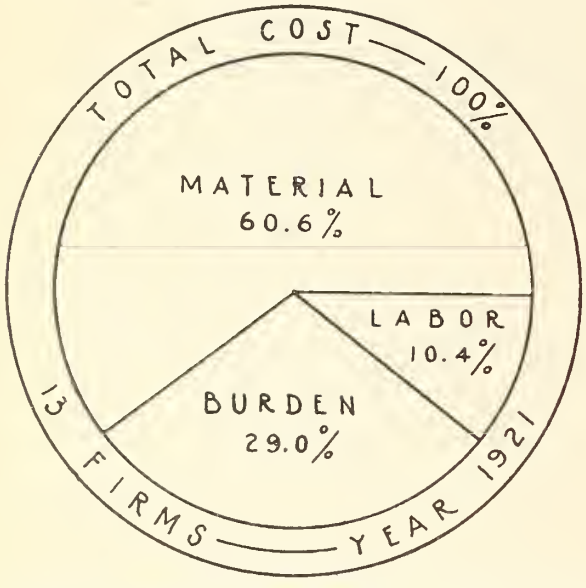
5. **Commercial Burden** is all cost occurring after the manufacturing processes have been completed; that is, all warehousing, delivery (no outgoing freight), selling, general office, and administrative expenses. Commercial Burden is expressed as a percentage of **Factory Cost,** which is Direct Material plus Yard and Kiln Burdens, Plus Direct Labor, plus Labor Burdens.



Comparative analysis of cost complied by the Millwork Cost Bureau from the reports of Bureau accountants to thirteen member-firms, each of which had undergone the processs of a cost survey and installation of the standard cost finding system. Complete copies of the chart will be supplied gratis to any millwork operators by the Millwork Cost Bureau

Explanation of the Chart

Throughout the chart, where the terms Material and Labor occur, they signify **Direct** Material and **Direct** Labor. All other terms, symbols, etc., occurring on the chart are self-explanatory. Observe that each firm's total cost for the year is illustrated graphically in three ways, first, by rectangular graduations representing dollar values for each component unit of material, labor, and burden, second, these component units or sub-factors are combined into their three main factors—material, labor, and burden —and likewise are charted in rectangular graduations for dollars expended; third, each firm's annual total cost is depicted by means of a circle with segmental divisions indicative of the per cents of material, labor, and burden constituting the whole or 100%. The board feet of lumber consumed and the board feet kiln dried are shown in parentheses in the left-hand margin of the chart, as are also the number each of Direct Machine and Direct Bench Hours. This information is included for the purpose of describing more specifically the nature of each firm's business.



The proportions of material, labor and burden in the millwork operation of the thirteen firms

The burden factor of each plant has also been converted to rates in accordance with the standard M.C.B. practice outlined earlier in this review. These rates appear to the right of the unit burden delineations. **They more than any other medium express the precise cost status.**

Firm "A", with a consumption of nearly 5,000,000 board feet of lumber and $375,000 worth of Other Direct Material, it is apparent conducts an extensive retail yard and jobbing business in addition to its manufacturing operations.

Firm "B", also indulges heavily in jobbing, as is evident from the extent of the Other Direct Material. This plant used, in dollars, almost the same amount of lumber as "A", but the feetage is approximately 1,000,000 feet less. Its predominating lumber was therefore of a higher grade and value than "A's", even though "A", as may be seen by a comparison of the Direct Labor Hours, did considerably more manufacturing than "B". Note that "A's" Yard Burden is about $6,000 lower than "B's" and that "B's" kiln operation was more costly than "A's". "B's" totals in both instances involved much less feetage, which is evidence that "A" operated nearer maximum capacity than "B", or that "B's" equipment is at fault. The fact that "B's" Machine Burden is equivalent to 93 cents per man-hour and "A's" only 51 cents, bears out this contention. "A" it may be observed produced more cabinet than machine work, whereas with "B" the production was largely trim, etc.

Burden in the Various Plants

The highest composite burden of any one plant expressed as a percentage of total cost is 40% in the case of Firm "M" (refer to the segment in "M's" circle marked "b"; that is Burden). Firm "D" experienced the lowest aggregate burden: viz., 22.2% of total cost. However, it is interesting to note that Firm "D's" Factory Burden rates—Machine and Bench—are in nowise low; in fact they rank among the very highest. Its redeeming feature, or the one responsible for the low level of its total burden, lies in having disposed of much jobbing stock at a very economical operation of the warehouse and office units. Commercial Burden in this case amounts to only 8% of Factory cost. That is perhaps the lowest rate developed since 1914.

Observe the excessive Commercial Burden occasioned in the operation of plant "F". Ordinarily, a jobbing business—which is essentially what this was —tends to diminish the rate of Commercial Burden, but in this instance the rule miscarried. This particular exception to the rule may be due to jobbing large quantities of materials of low value and employing too costly warehousing and sales facilities for their carrying and disposal. Then again it may be attributable to that not uncommon post-war condition—a radical decrease in the value of stocks consumed, without a corresponding reduction in commercial expense. Firm "F", as has been indicated, engaged in manufacturing in only a limited way, which fact is responsible for its high factory burdens. Comparatively, it appears that the yard site is too extensive or too valuable for its milling department; otherwise why should the rate of Yard Burden be the imposing sum of $15.40 for every thousand feet of lumber consumed?

Compare the total costs of Firm "F" and "G". For all practical purposes they are identical. Little differences exist in their gross burdens. "F's" total material exceeded "G's" by approximately $25,000 which, however, is not a momentous difference. Why then is "G's" total Commercial Burden and its per cent rate so much less than "F's"? The answer is, Firm "G" directed its energies towards a voluminous consumption of lumber, amounting to about 2,250,000 feet more than "F's". Plant "G", as is evident from the Machine Wage and Machine Burden units, indulged rather extensively in certain fabricating processes, such as box construction with power-driven equipment, or a trim operation involving a low-priced wood. In either event the material turnover was rapid and the carrying cost small. "F's" Other Direct Material consumption required extensive warehousing facilities, whereas "G's" lumber turnover, which was its heaviest unit, entailed only the use of a yard and sheds.

This review could be carried on almost interminably along the lines followed in the preceding discussion, but inasmuch as the chart is so very complete it will be the reviewer's purpose to refrain from further comment of that nature. The reader, however, should continue the scrutiny and establish additional conclusions. The impressive points of this analysis are first, that the thirteen firms show an

aggregate burden equivalent to 29% of total cost, which is much more than the average labor factor of all plants or, for that matter, of any individual plant. It should be pointed out also that the segments representative of the per cents of total burden are much lower than if they were expressed as a per cent of material and labor combined. A burden given as 25% of total cost is equivalent to 33-1/3% of material plus labor cost. The second point which must impress one is that the M.C.B.'s standard plan of burden derermination; viz., Yard and Kiln Burdens at a rate per thousand board feet, Factory Burdens at a rate per man-hour, and Commercial Burden at a per cent rate of Factory Cost, constitutes the only correct and logical medium for burden experssion. the circles with segmental proportions are resorted to merely for analytical purposes, and whenever used should be accompanied by unit rates as in this instance. The rates shown on the chart should not be considered representative of the industry nor of the Bureau membership. They are simply individual experiences.

Furniture Business Active

The New York Exposition Was Remarkably Successful—Record Number of Sales

The New York furniture exposition opened on October 16th in the new permanent home of the New York Furniture Exchange, with the largest first day's attendance ever recorded at any exposition. There was a total of 449 buyers registered on the first day of which 400 were from eleven eastern states. Up to the present writing the total attendance for the two weeks of the exposition numbers 2,812 which is a record breaker.

The volume of business written also exceeded any previous business, even during the days when everybody rushed pell mell to buy merchandise, but the difference was in the fact that the dealers used judgment and discretion and did not overbuy as they did three years ago. It was unfortunate, however, that a great many of the manufacturers had an immense volume of business on hand, and owing to the great demand, many of them were compelled to hang out "sold up" signs after the third or fourth day of the market season, but fully sixty per cent of the manufacturers continued to take orders until the close of the show, promising to do the best they could to fill orders.

Prices range from ten to twenty per cent higher than last April according to the grade of merchandise. Bedroom suites which contain mirrors were advanced more than furniture that did not contain mirrors due to the rapid advances in the price of mirrors which show an increase of over 50% in the past four months, and what has made it worse has been the inability to secure the mirrors even at the increase in price.

It can be truthfully said that this has been the most successful of all previous expositions, both in number of attendance and in volume of business that was written.

Edward Clark Passes Away

The passing of Edward Clark, father of A. E. Clark, Toronto, president of the Canadian Lumbermen's Association, removes a veteran figure in the lumber industry. Mr. Clark who was seventy-five years of age, died at the residence of his brother, Rev. Dr. George Clark, St. Catharines, Ont., on November 12th, after a long period of poor health. He was born in Hull, England, and came to Canada when six years of age, locating with his parents at Dundas, Ont., and later in Binbrook township. When Mr. Clark first started out for himself he lived in Forest and later in Bridgen where in addition to conducting a farm, he operated a sawmill. During his residence in Bridgen he bought blocks of timber from the neighboring farmers and conducted an extensive rural lumber trade. Eventually disposing of his mill and other interests he embarked in the wholesale lumber business in Hamilton, Ont., where he remained until 1907 when he came to Toronto. The firm was first known as Edward Clark, then as Edward Clark & Sons and later as Edward Clark & Sons, Limited. It has been conducting a large wholesale trade in birch and other hardwoods and has extensive connections all over Canada and the United States.

The funeral took place on November 14 from the residence of his son, A. E. Clark, every branch of the forest products industry being well represented at the service. A large number of beautiful floral tributes were sent by friends and organizations with which he was connected.

Accurate Cost Accounting

The importance of accurate cost information in dull times is emphasized by William R. Basset in the American Machinist. A delusive cost system is much worse than none at all. Most home-made systems are delusive. They do not take enough factors into consideration.

The common method for getting at sales expense is to divide the total of merchandise by the total of sales expense. The figure thus obtained is supposed to be the percentage cost per dollar of sales. This is true only if all the goods are exactly alike, priced alike and sold under the same conditions. What really results is the loading of high-priced articles with such a volume of sales expense as to make their movement difficult and to relieve low-priced articles of so much sales expense that actually they are often sold at a loss.

The subject of units of sale is one which deserves a great deal of attention from business men. The unit must be determined by the costs and when that unit is once determined, variations from it have to be sold at prices dictated by the relative cost.

Sales costs are rarely accurate and manufacturing costs are in but little better condition. One of the many fallacious ways of estimating a manufacturing cost is to compare the labor and overhead with the cost of the material. This method can hardly give a figure that means anything because the value of the material is only a factor entering into the cost of the finished product. The value itself in no way determines the amount of work that has to be put on the material or the space it occupies.

Simplicity is the keynote of modern cost accounting. But the simplifications have to be scientific.

Driscoll's factory in West St. John, N. B., has been working on dressed lumber through the summer and early fall. The expectation is that this plant will be operated through the major portion of the winter as usual.

Check Up the Circulation in Your Dry Kiln

Uniform Air Movement is the Important Factor in Successful Drying—If the Kiln Depends on Natural Circulation, Provision Must be Made for Controlling and Directing it if Drying is not to be Prolonged and Cost Increased

By F. P. Poole*

Circulation, that is, adequate, uniform circulation, is probably the most important factor in the successfull drying of lumber by artificial means. There are other necessary factors such as heat and humidity, but as the movement of air is depended upon to carry the heat and humidity and to distribute it evenly throughout all parts of the kiln, unless the circulation is positive and uniform, the temperature and humidity will vary in different places, which means uneven drying. Further, where the circulation is sluggish or even non-existent, conditions in those particular places are beyond the control of the operator. This means uneven drying and unnecessarily long drying periods.

Another point that might be mentioned is that as air quickly becomes saturated with the moisture picked up from the lumber, warm fresh air must be supplied to remove the moisture as rapidly as it comes to the surface of the stock. That being the case, it is not difficult to see that unless warm dry air is supplied in sufficient volume the rate of drying is retarded and where the air movement is sluggish or non-existent little if any drying takes place. All this points to the importance of circulation and suggests why it should be uniform and adequate in all parts of the lumber piles and in all parts of the kilns.

In most of the kilns operated in connection with woodworking plants the circulation depends on the natural movement of air; that is, advantage is taken of the fact that air rises when heated and drops as it picks up moisture and cools. Thus, in the ordinary kiln we have currents of warm air attempting to rise and currents of cooler, moisture-laden air attempting to drop. These two opposing currents meet in places, often in the centre of the lumber piles, and gradually reach a state of equilibrium, with the result that pockets are formed in which there is practically no air movement.

Air Pockets Delay Drying

In view of the fact that warm air rises and that it tends to follow the line of least resistance it is difficult to see how an adequate even circulation of warm air through the lumber piles can be secured and maintained when depending solely upon the uncontrolled natural movement of the air. If the warm air follows the lines of least resistance in its upward movement most of the air will tend to rise on either side of the piles of lumber, with a slight flow into the edge of the piles. These two currents come together at the top and then attempt to gradually drop down through the lumber, only to be met by the warm air that is attempting to work its way up from the bottom of the pile. The result is that as the ascending and descending currents meet and stabilize in the centre of the pile a dead air pocket is formed, which gradually decreases as the drying progresses, but which also prolongs the drying period for it is usually several days behind the rest of the pile.

From the foregoing it will be seen that some method of controlling and guiding the natural movement of air must be devised before a free movement of air through the piles of lumber can be expected. In the case of a kiln with forced circulation, conditions are somewhat different, as a certain amount of control may be exercised both as to volume of air moving and the rate and direction of flow. Through,

Since it is the air that removes the moisture from the surface of lumber in a dry kiln, the movement of the air must be ample in all parts of the kiln, or uneven drying will result. The drift of smoke produced by some burning substance is often used as an indicator for searching out zones of too rapid or sluggish circulation in kilns.

This method is greatly facilitated by the use of the apparatus shown here which was developed at the U.S. Forest Products Laboratory, Madison, Wisconsin. In this device, the use of which involves no fire hazard, as in burning rope, punk, etc., in the kiln, the fumes of hydrochloric acid are blown across ammonia; and an abundance of harmless, visible fumes are produced. These fumes, being of approximately atmospheric temperature, have little tendency to rise or fall independent of air currents. (Photograph furnished by the U.S. Forest Service.)

a proper arrangement of inlet and outlet ducts it is possible to secure a fairly even flow of air through all the piles of lumber. Even here it has been found that the best results have been obtained when the distance the air must travel in going through the piles is as short as possible.

Control the Natural Circulation

Where natural circulation prevails, the movement of the warm air through the lumber piles is bound to be more or less uncertain unless provision is made for controlling and directing it. This is often accomplished through the judicious use of baffles and

*Assistant engineer, Forest Products Engineering Co., Chicago.

curtains. Often the drying operation may be improved and the drying period shortened by directing and controlling the warm air through simple and inexpensive changes in pile design.

One of the most reliable circulation tests is the smoke test in which what is termed chemical smoke is used. This smoke moves with the air and renders the air currents visible so that they may be followed with the eye. A wide range of variation in temperature in different parts of the kiln is an indication of poor, uneven air movement and if the stock in the centre of the piles is found to contain a high percentage of moisture when the rest of the pile is dry it means that the air has not been moving through the pile. As the lumber should be left in until the centre, as well as the outside of the piles, is dry, such a condition increases the drying cost as it prolongs the drying operation.

If you are not entirely satisfied with the rate of drying or if you find wet stock in the centre of some of the trucks, it would be well to check up on the circulation, for it is likely that that is what is at fault.

The Importance of a Layout Sketch

Should be the First Step When Considering an Improvement or Change in Your Dry Kilns or Yard Storage—Visualizes Your Whole Plant, Helps to Avoid Mistakes and Shows You the Best Arrangement

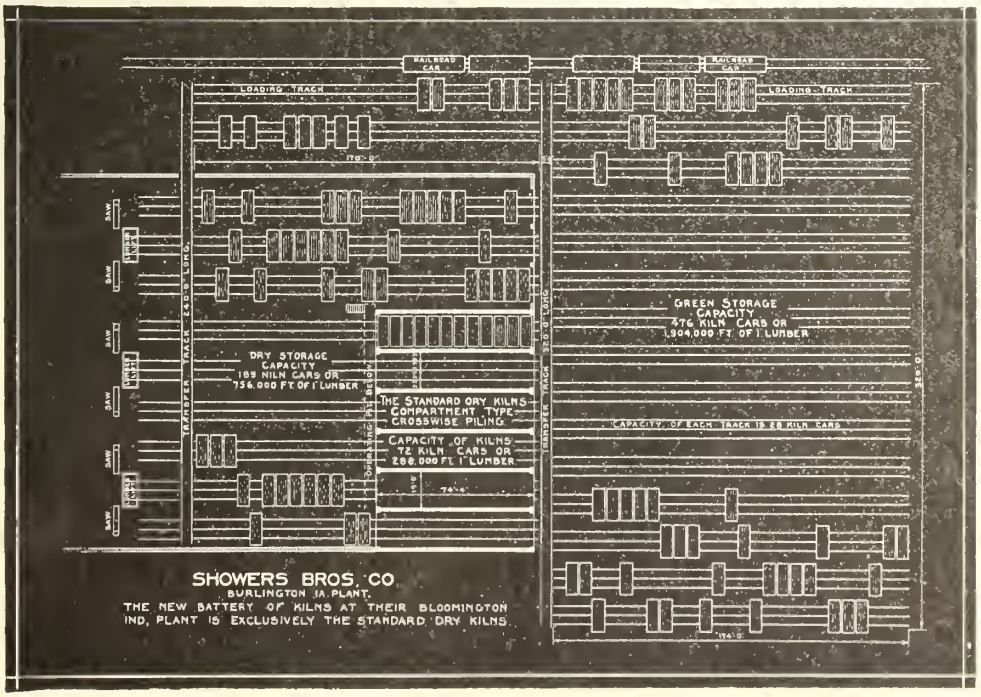
By Victor R. Jose, Jr.*

If you consider and modernizing or changing of your dry kilns or yard storage, your first step is a layout. Most people appreciate this better after they have tried to put in kilns without it. But to get the greatest future value from your kilns and all of the equipment connected with them, it is very important that the entire system of handling the lumber and the type of kiln be crystalled into the form of what is ordinarily called a layout before and binding steps are taken.

The relation of your kilns to the plant, to the cutting room, to the railroad switch, your yard storage and boiler room can be judged more accurately, because they stand out more clearly, by means of a layout. It is often very surprising the way the angles at your property line call your attention to losses of space, unnecessary losses, when you put the space required for your kilns and storage tracks on paper.

The example shown in Fig. 1, (Showers Bros.' Burlington plant) is a sketch made by a layout engineer for the well-known firm of Showers Bros., when they first planned their mammoth new furniture plant at Burlington, Iowa. This layout was made before they had placed their order for kilns and lumber storage equipment because they recognized the possibilities and advantages of visualizing their plans. Of course, the cut shows the sketch reduced from the original size.

An added advantage in a sketch is the fact that such a layout will contain the experiences of the layout engineer which he has gained in many other plants having conditions often similar to yours. He not only presents and advises as to what he has found


RAILROAD CAR
LOADING TRACK
DRY STORAGE CAPACITY 189 KILN CARS OR 756,000 FT. OF LUMBER
THE STANDARD DRY KILNS COMPARTMENT TYPE CROSSWISE PILING
CAPACITY OF KILNS 72 KILN CARS OR 288,000 FT. LUMBER
GREEN STORAGE CAPACITY 476 KILN CARS OR 1,904,000 FT. OF LUMBER
CAPACITY OF EACH TRACK IS 28 KILN CARS
SHOWERS BROS. CO.
BURLINGTON IA. PLANT.
THE NEW BATTERY OF KILNS AT THEIR BLOOMINGTON IND. PLANT IS EXCLUSIVELY THE STANDARD DRY KILNS.

A layout sketch that was made in anticipation of plant extensions

*Of the Standard Dry Kiln Co., Indianapolis, Ind.

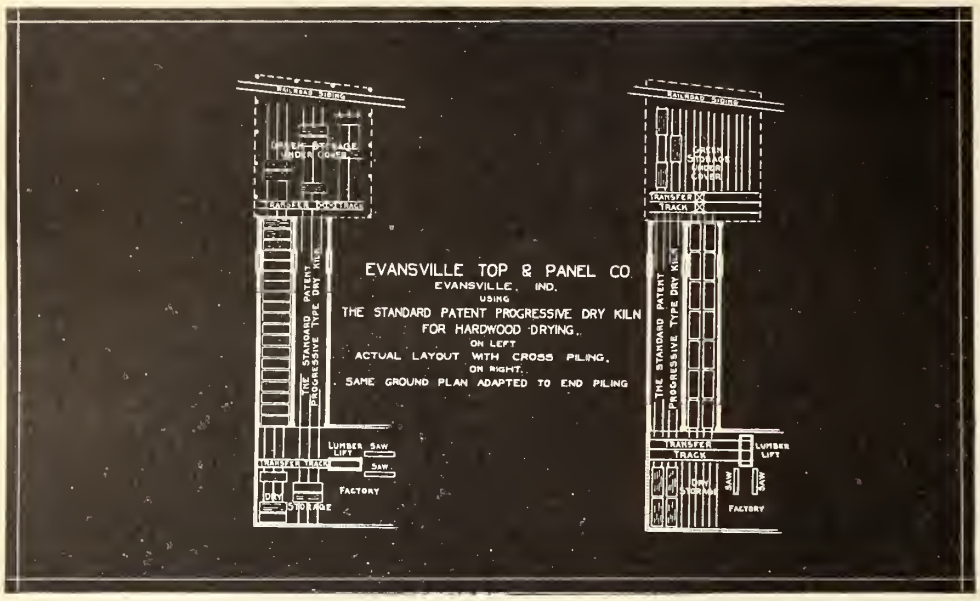


Fig. 2—A layout plan enabled the Evansville Top & Panel Co., to decide the best yard and kiln arrangement for their needs.

of value, but he is able to avoid mistakes which he noticed in other plants and this is often even more important.

In the Showers Bros.' layout the kilns were only one of the important items to be considered in planning their equipment for seasoning their lumber. Enough dry storage space had to be provided to insure against delay in unloading when the lumber was seasoned. Likewise loading capacity is very necessary, and having determined these two points it was necessary to proportion them properly.

After the first layout was made it was immediately seen that, while it had excellent points, the layout as a whole might interfere with future expansion. This might be overlooked without layout, but it was very easy to catch the omission using a layout. The fact that different points are visualized makes it much easier.

The layout also shows very quickly the lines which your production follows, whether it is straight line production or whether any "back tracking" occurs.

Fig. 2, illustrates another great possibility presented by a preliminary layout. The Evansville Top & Panel Company, whose kilns are shown on the left in Fig. 2, were able to decide which type of kiln, cross piling or endwise piling, would best serve their purpose, by making a comparison layout on similar ground plans. You will notice that the truck of lumber at the end of the mill room, the relation of the unloading track to the railroad siding for unloading,

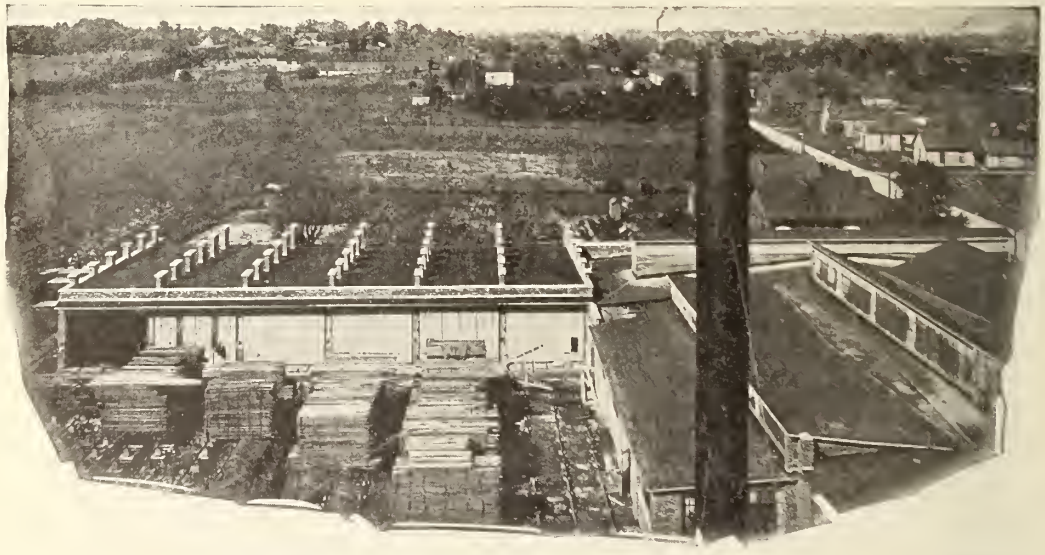


Fig. 3—The Showers Bros. Co's., latest installation of dry kilns worked out in accordance with a layout sketch

location of saws and lumber lift and other equipment were shown in such a way that they could actually determine the best arrangement for their particular needs and avoid errors which often prove very costly in the future.

Many people ask what type of piling, cross piling or end piling, is the better. As in the case of the Evansville Top & Panel Company illustration, many points which are involved in the answer to this question are made much plainer to the person who has had only a little experience, when their advantages

(Continued on page 65)

Basic Time Standards in Woodworking

Ordinary Time Standards Do Not Indicate Operation Times as They Should Do —Comparison of Rates Expressed in Time and Money—Common Terms of Expression Essential Before Comparisons can be Made

By L. R. Wright*

Before discussing basic time standards it might be well to touch on the advantages of ordinary time standards, recently remarked J. F. Hirt, Vice-president of the Forest Products Engineering Co., Chicago, in an address delivered before the Chicago Furniture Manufacturers' Association. Time standards if accurately developed indicate exact machine capacity. By segregating and tabulating the operation times required by each individual part of the various items going through the plant, based on the times indicated by the time standards, the total times for the various machines will give the machine hour requirements of the work in progress.

Taking the machine hour requirements for any given article it becomes possible to promise specific deliveries between department and department and for all orders going through the plant, for the machine hour requirements will indicate just how the work will progress and when it should be ready for delivery.

From this it becomes an easy matter to predetermine labor costs for having the machine hour requirements and knowing the hourly rate paid to the various operators, it is not difficult to calculate the labor costs. If this can be done it is very desirable, but perhaps that is expecting too much. Certainly, the exactness with which labor costs can be predetermined depends entirely on the accuracy of the time standards.

Further, time standards are also used as a basis to pay for the labor involved in proportion to what is produced. By including an incentive in the rates established on the time standards it usually follows that the workmen become more interested and increase their efforts.

In the past, and even to-day in many plants, ordinary time standards were established on past performance or upon time studies, neither of which provide a satisfactory basis for developing standard times. Cost records may indicate what the labor times have been and time studies may indicate approximately what they are, but neither cost records nor straight time studies give any indication as to what the operation times should be. Further, the average workman is familiar with time study methods and when he is being observed he often attempts to mislead the observer. The making of time studies may be likened to a gamble between the time study man and the machine operator and the result is that the standard or rate so established is of very little value.

For instance, suppose a standard is being set on belt-sanding a dresser top. Unless the observer knows the exact amount of pressure the workman is placing on the pad and also knows when the piece has been fully sanded there is no assurance that the rate set bears any relation to what the time should be. In other words, ordinary time standards are only as good as the observer.

Ordinary Standards Not Permanent

Another point is that ordinary standards expressed in rates and tables are not permanent. As a line is changed new standards must be set to cover the new operation times. These new times should not be guessed at, neither is it satisfactory to estimate from previous standards, but further time studies must be made. This means that in the furniture industry where the designs are being constantly changed and

REPORT OF EARNINGS

DEPT MACHINE PAGE NO 2

PERIOD ENDING SEPT. 22, 1922 NO HE-18.

NO	EMPLOYEES NAME	CLOCK TIME	DAY WORK	TIME ON INCENTIVE PLAN	TOTAL EARNED TIME	TIME OVER	TIME UNDER	OPERATION
17	Rogers	50	7:15	42:45	53:17	3:17		Shaper
6	Palmer	50	3:20	46:40	56:33	6:33		Boring
15	Ellis	50	:30	49:30	48:17		1:43	Rip saw
3	Hasse	50	:	50	61:09	11:09		Band saw
7	Flint	50	12:10	37:50	54:44	4:44		Sander
11	Keppel	50	8:40	41:20	57:16	7:16		Tenoner
9	Hofgren	42	2:45	39:15	43:10	1:10		Sticker
2	Mihel	60	3:50	46:10	50:27	:27		Swing cut-off
14	Van	50	6:25	43:35	63:19	13:19		Mortiser

Table 2—How workmen's earnings are kept on the time rate basis

Table 1—Comparison of Performance Standards Expressed in Time and Money

Time studies indicate that certain operations should be performed as follows: No. 1, 11 minutes; No. 2, 33 minutes; No. 3, 41 minutes; No. 4, 18 minutes. These are minimum times. Allowances are added according to the requirements of different operations as follows: No. 1, 4 minutes; No. 2, 12 minutes; No. 3, 9 minutes; No. 4, 12 minutes. This makes established time standards of: No. 1, 15 minutes; No. 2, 45 minutes; No. 3, 50 minutes; No. 4, 30 minutes.

Piece work rates figuring on 60 cents an hour.	Earned time rates regardless of hourly rate.
No. 1. ..... 15 cents	No. 1. ..... 15 minutes
No. 2. ..... 45 cents	No. 2. ..... 45 minutes
No. 3. ..... 50 cents	No. 3. ..... 50 minutes
No. 4. ..... 30 cents	No. 4. ..... 30 minutes

Suppose the hourly rate drops 20 per cent, or on a certain operation you find it necessary to use a workman receiving a higher or lower hourly rate, the rates expressed in money would have to be re-figured to conform to the changed hourly wage rate. For a 20 per cent drop the change would be as follows:

Piece work rates figured on 48 cents per hour.	Earned time rates no change required.
No. 1. ..... 12 cents	No. 1. ..... 15 minutes
No. 2. ..... 36 cents	No. 2. ..... 45 minutes
No. 3. ..... 40 cents	No. 3. ..... 50 minutes
No. 4. ..... 24 cents	No. 4. ..... 30 minutes

Rates expressed in time are flexible. They do not require changes on account of fluctuating wages. They apply to present lines but for all new designs or changes in present designs, entirely new standards should be established. It does not pay to estimate from previous time standards.

*Statistician, Forest Products Engineering Co., Chicago.

where new designs are being brought out twice a year for the January and July markets, the services of one or more time study men would be in constant demand in each plant. It hardly pays to do this as it means a continual expense so that usually ordinary rates soon lapse and the system is discarded.

Since the development of what we call basic time standards all this has changed. From comparative data secured in numerous plants it has been possible to establish basic time standards which give operating time as they should be. This called for the crea-

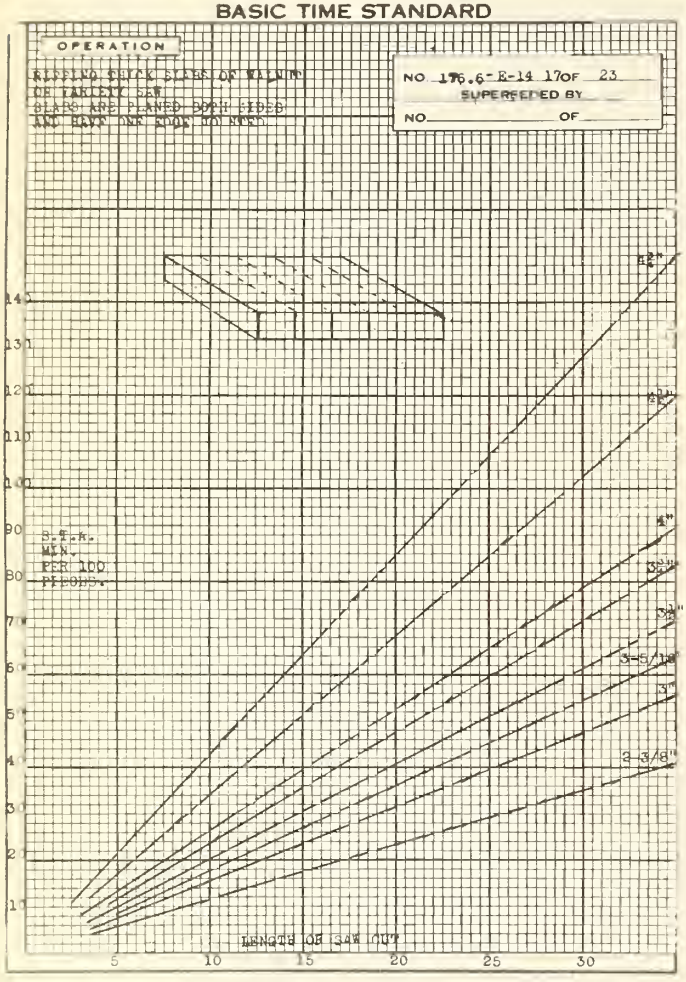


Illustration No. 3—Chart to show the application of basic time standards

tion of a common language or common terms of expressions. The same operation may be performed in different plants in many different ways or on different machines and as a result a comparison of the output or of ordinary standards which may be established does not mean anything. Similarly, two standards established in different plants are not comparable, unless such factor as rates of feed, speed of cutters, angle of cutters, layout of equipment and other details are known. Before results in different plants can be compared all the details pertaining to the operations under comparison must be known and must be expressed in common terms. Comparative data expressed in common terms is the foundation upon which basic time standards have been developed.

Before showing the application of basic time standards I would like to discuss briefly the various methods of paying for labor. Table No. 1 shows a comparison between rates expressed in money and rates expressed in time. Rates expressed in money must be changed to conform to the hourly rate earned by various operators and in corformity with every change in wage levels. Rates expressed in time do not change so frequently because an operation time should not change unless there has been some change in equipment, layout, etc. For this reason time expression rates are in use in practically all industries.

Keeping Track of Earnings

Expressing the rates in time, it becomes an easy matter to keep track of the earnings of the various workmen. The report of earnings form, illustration No. 2, show how this is accomplished. The clock hours are shown in the first column, then the time on day work. This is followed by the time on incentive work and the total earned time, which consists of the total day work time as indicated in that column and the total earnings under the incentive plan. A comparison of the total time earned and the clock hour shows whether the workman exceeded or fell below the standard set. It is usual in introducing a plan of this kind to guarantee the clock hours for a limited period so that a workman falling below is not penalized at the start.

This form also constitutes the foundation of an unusually good foreman's bonus plan. In developing the foremen's bonus, two factors are considered, the extra earnings of his department and a reduction in day work. Usually the foreman is paid 50% of the average "time over" of the men under him and 10% of the amount the day work is decreased below a certain standard. Thus he has two incentives, one to increase the output of his department and the other to cut down the less productive day work. Under this plan it is not necessary to suggest to the foreman that so and so is not producing as he should or that this man should be let out. Every man that is not earning a bonus is losing money for the foreman. It is in his interest to concentrate on the weaker men.

The foreman is given a copy of the report of earnings as issued. He checks over the earnings of those

Band Sawing

(Pocket Cases No. N 786-7 Pieces in 1¾ Block.)

	9/32 Saw, July 5	7/32 Saw, July 7	7/32 Saw, Increased set, July 10	Same saw, corner rounded in design Aug 2.	After 2 days co-operative coaching
Cut No. 1	1.32	.865	.68	.62	.515
Cut No. 2	.996	.785	.525	.47	.407
Cut No. 3	.684	.54	.522	.415	.331
Cut No. 4	.617	.65	.436	.352	.297
Cut No. 5	.766	.615	.538	.446	.347
Cut No. 6	.731	.55	.473	.415	.339
Cut No. 7	.881	.54	.565	.475	.393
Cut No. 8	4.617	3.36	2.318	2.543	2.184
Handle 9	.221	.19	.225	.222	.167
Totals—	10.833	8.095	6.282	5.959	4.960

under him and then tries to bring the "time under" men into the bonus class. If he finds that there are those who seem unable to keep up with the rest he will suggest that they be given work for which they are better adapted or let out altogether. All this has a marked influence on the productiveness of the de-

partment and tends to rouse and maintain foreman interest and incentive.

The difference between basic time standards and ordinary standards are; first, basic time standards are not based on conditions in any one plant or locality but on comparative data from many plants; second, they give operation times as they should be regardless of what the times may be in any plant and third, they are so developed and charted that rates may be accurately and quickly established on new as well as existing designs, by almost any clerk in the organization. This does away with the necessity for further time studies on new lines and means that basic time standards when once installed are permanent.

Application of Basic Time Standards

The wide application of basic time standards may be gathered from the rip saw chart shown in illustration No. 3. The time for ripping walnut squares from glue-up slabs can quickly be determined for lengths from 5 to 35 inches, and thicknesses ranging from 2⅜ to 4¾ inches. To use this chart simply select the length of the saw cut on the lower margin and run up to the curve which applies and then to the left hand margin. The figures there indicate the standard time in minutes required to rip 100 squares.

The example shown in illustration No. 4 shows how basic time standards assist in establishing operation times as they should be—minimum operation times. Straight time studies in a certain plant indicated that band sawing certain pockets for instrument cases required 10.833 minutes while basic time standards indicated that 5 minutes was a fair time for this operation. In order to bring the time down to as near the standard as possible certain changes were made as indicated; first, a narrower blade was used; second, more set was carried; third, a slight change was made in the design and fourth, the operator was coached in the best method of handling the work, with the result that the time was finally reduced to 4.960. Neither straight time study nor ordinary time standards could have indicated that the first time, which was the actual time, was just twice what it should be. In this instance, the fifty per cent reduction in time was due solely to the fact through basic time standard it was shown that the actual time of 10.833 minutes was away too high.

If space permitted other examples of the application of basic time standards might be given and the effect on costs shown. Definite knowledge of what operation times should be is essential before an intelligent effort can be made to reduce labor costs to what they should be.

Can Wood be Made More Durable?

There is Need for Effective Protective Paints to Preserve Wood Against Moisture and Increase its Durability and Dimensional Stability—Ordinary Paints are Not Effective as Moisture Proofing Agents

By Cornelius T. Myers*

About two years ago the writer, in carrying on some research work on wood wheels had occasion to make inquiry among paint manufacturers as to the value of various kinds of paints and primers for the protection of wood against moisture. This inquiry brought out so many differences and variations in opinion as to paint materials and mixture proportions that a more extensive inquiry among paint men was started. This inquiry revealed that:

(1) There was comparatively little technical information to be gained from the paint industry on the relative protective values of different coatings for wood.

(2) The paint industry did not generally recognize the moisture-proofing of wood as a problem, but was concentrating so far as the more reputable manufacturers were concerned on producing paints that would last as long as possible on the surface to which they were applied. In other words, such improvements as have been made have contributed to the life of the coating rather than the life and usefulness of the article which received the coat.

As the demand upon our forests depends to a very considerable extent upon the life of forest products, and as the life of these products in many cases depends to a very considerable extent upon the protection against moisture they receive, the intimate knowledge of protective coatings is a factor of great importance in our lumber conservation program; to say nothing of the possible saving in our large annual paint bill. Wood in its natural green condition has a very limited use as a structural material. Its tiny fibres are cellular in form and contain a large amount of moisture, commonly known as sap, the sap being water containing very small percentages of tannins, sugars, gums and coloring matters. To give wood the physical qualities which make it fit for use in buildings, furniture, truck bodies, wheels, etc., it is necessary to remove most of the moisture.

Moisture in Wood

Wood is said to be oven-dry when continued oven drying causes no further loss of weight. In their green state the woods used structurally have a moisture content of 60 to 120 per cent. of their oven-dry weight, and weigh roughly from 60 to 120 per cent. more than when they are in an oven-dry state. In other words, 35 to 55 per cent. of the weight of a green log is water. In the green log this water exists in two conditions:

(1) Minute particles of water in each tiny wood cell cavity, known as "free water."

(2) The moisture absorbed by the fibrous material which forms the walls of the cells, known as "hygroscopic moisture."

Felled wood exposed to average atmospheric conditions gradually dries, the air taking up its moisture. First the cell cavities slowly give up their moisture. This evaporation goes on until the cell cavities are emptied of the minute particles of "free water" they contain. All that remains is the moisture actually absorbed by the fibres of the cell walls, which are still saturated with the "hygroscopic moisture." Wood in this state is said to be at its "fibre-saturation point." Up to this time the wood does not

*In "Mechanical Engineering."

appreciably change in size or in physical characteristics except as to weight, which of course decreases considerably as it will now contain but 25 to 30 per cent. of moisture instead of 60 to 120 per cent.

Further drying of the wood is necessary in order to increase its strength and hardness, increase its

TABLE 1 APPROXIMATE PERCENTAGE OF INCREASE IN STRENGTH OVER GREEN[1]

	Dried to 14 Per Cent Moisture	Dried to 8 Per Cent Moisture
Bending strength, modulus of rupture	40 to 60	80 to 100
Compression parellel to grain	80 to 90	100 to 150
Compression perpendicular to grain	65 to 75	
Stiffness, modulus of elasticity	20 to 30	25 to 35[2]
Hardness	30 to 35	40 to 50[2]
Shearing strength, parallel to grain	40 to 50	60 to 70[2]

[1] Compiled from Data given in Timber, Its Streagth, Seasoning and Grading by H. S. Betts.
[2] Estimated.

TABLE 2 SHRINKAGE AND MOISTURE CONTENT OF HARDWOOD[1]

	Specific Gravity of Dry Wood	Shrinkage[2] in Per Cent of Green from Green to Oven-Dry Radial	Tangential	Green Moist in Per Cent of Dry Wood Wt.
Ash, white[3]	0.57	4.8	7.0	39
Birch, yellow[3]	0.55	7.4	8.9	68
Elm, cork	0.57	4.8	8.1	53
Hickory[4]	0.64	7.2	10.9	60
Maple[5]	0.51	4.2	8.5	63
Oak, red[5]	0.56	3.9	8.3	83
Oak, white[5]	0.60	5.3	8.8	66
Average	0.57	5.4	8.6	62

[1] Compiled from data given in Kiln Drying of Lumber by H. D. Tiemann
[2] Average shrinkage along the grain, up and down as the tree grows, is only about ½ per cent.
[3] Average of 2 species
[4] Average of 9 species
[5] Average of 3 species

durability, enable it to take and hold paint, and in general to improve its condition for the purpose intended. As this drying progresses beyond the fibre-saturation point ,the cell walls give up the moisture they have absorbed, and in so doing they shrink and harden. Under natural conditions this drying process will continue until the amount of moisture in the wood bears a quite definite relation to the average humidity conditions in the particular locality. (See Fig. 1.) In the eastern and north central states, for instance, the moisture content of wood will become stabilized somewhere in the neighborhood of 14 per cent. for what is known as thoroughly air-dried stock. In the arid, southwestern states it will contain a still

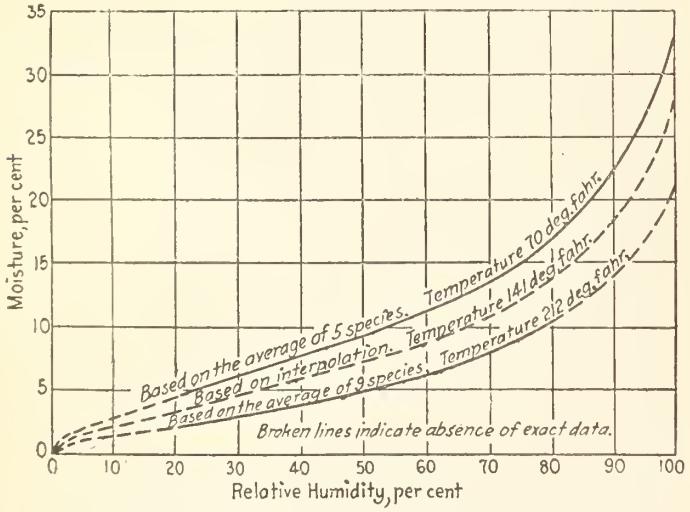

Moisture, per cent
Relative Humidity, per cent
Based on the average of 5 species. Temperature 70 deg. fahr.
Based on interpolation. Temperature 141 deg. fahr.
Based on the average of 9 species. Temperature 212 deg. fahr.
Broken lines indicate absence of exact data.

Fig. 1—Relation between the amount of moisture absorbed by wood and the average relative humidity

lower percentage, while in the former war zone of France the wood will normally contain considerably more than 14 per cetn. of moisture. Of course unpainted wood that is exposed to rain and snow will absorb considerably more than 14 per cent., depending upon the dimensions of the piece and the extent of the exposure.

Data secured from the Forest Products Laboratory of the United States Department of Agriculture show that:

(1) Many woods should be dried to about 8 per cent. moisture content to give the best results as to strength, durability, hardness and finish. (See Table 1).

(2) It is also true that if after being dried, and shrinking in the process, wood reabsorbs moisture, it will swell again according to the amount absorbed.

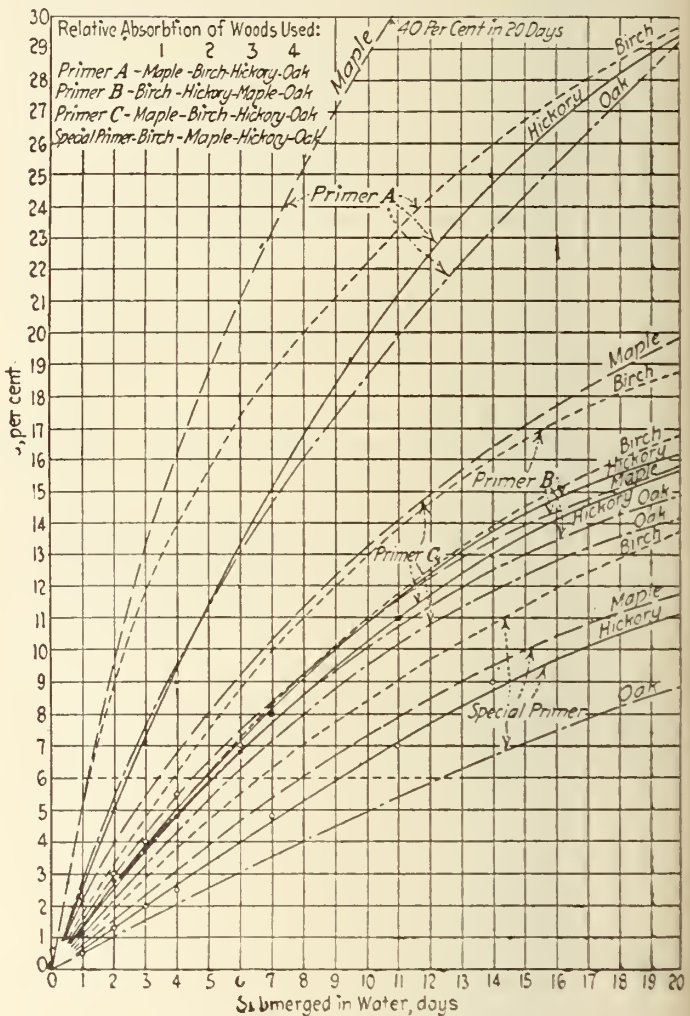

Relative Absorbtion of Woods Used:
1 2 3 4
Primer A - Maple - Birch - Hickory - Oak
Primer B - Birch - Hickory - Maple - Oak
Primer C - Maple - Birch - Hickory - Oak
Special Primer - Birch - Maple - Hickory - Oak
40 Per Cent in 20 Days
Primer A
Primer B
Primer C
Special Primer
Maple
Birch
Hickory
Oak
per cent
Submerged in Water, days

Fig. 2—Curves showing how the effectiveness of different primers as moisture-proofing agents varied for different woods

(3) The shrinking and swelling along the grain, perpendicular to the grain and tangential to the grain all differ, and very materially, for a given change in moisture content. (See Table 2.)

From the tables referred to it will be seen that it is quite desirable to have wood thoroughly dried, and that steps should be taken to keep it so. But although it is easy to reduce the moisture to 8 per cent in dry kilns, it is difficult to maintain the wood at this point; because of unsuitable protective coatings, or processes, and because of the lack of knowledge as to relative ability of various coatings for really stabilizing the moisture content within a small range.

Protectiveness of Paint

While we know that several coats of good paint may give adequate protection for floors, truck bodies, furniture, wheels or other wooden articles, we by no

means know what paint gives the best protection or what paints will give fairly satisfactory protection for the least money. The test fences, where many different paints were exposed to the same atmospheric conditions, have given some data on the durability of paints, but very little data on the durability of the painted article or its dimensional stability. In durability and dimensional stabilization we are greatly interested; in the first for very obvious reasons, in the second because wooden structures, furniture, etc., are more durable, serviceable, and can be made more simply if their various component parts do not expand and contract with changing weather conditions. The cost of drying could be reduced in many cases, if when dried to a certain point the moisture content could be stabilized. Wood, on account of its very valuable characteristics, could be used in places where metal now seems necessary. A dozen or more prominent concerns in the paint industry are co-operating very commendably in this research work, realizing that the dimensional stabilization of wood by moisture-proofing was a proper function of paint and of world wide importance. There is, however, quite a difference of opinion among these manufacturers as to what materials should be used, and how they should be mixed and applied. During the war the Forest Products Laboratory investigated the moisture-proofing effects of linseed oil and various paints, varnishes and leaf-metal coatings as applied to airplane propellers and other airplane parts made of wood, but this work has not been broadened because of lack of funds.

In order to get some comparative data on the paints and primers now on the market, the following schedule was drawn up by the writer, and tests were made on small pieces, measuring 1 × 1 × 1 in., of hickory, oak, birch and maple by several well known paint concerns:

(1) Dry slowly and completely until pieces cease to lose weight.

(2) Determine "oven-dry" weight.

(3) Allow reabsorption to 8 per cent.

(4) First coating to be applied at 8 per cent. moisture content.

(5) Second coating to be applied at 8 per cent. moisture content.

(6) Third coating to be applied at 8 per cent. moisture content.

Note: 24 hrs. to elapse between 4 and 5, and 5 and 6.

(7) Allow the three coatings to dry for a week under conditions of 70 to 80 deg. fahr. temperature, 40 per cent. relative humidity, under which condition the moisture content of the wood should remain at 8 per cent. even if the wood had no protective coating.

(8) Label and weigh for base weight at 8 per cent. moisture content with protective coating.

(9) Submerge in water at 70 deg. fahr.

(10) Weigh every 24 hr. for first week, every 48 hr. thereafter and determine percentage of increase in moisture.

In general, the results of the tests showed that paints of the ordinary brands and formulas were not very effective as moisture-proofing agents, even when three coats were applied. One paint concern after testing its standard brands, did a little experimenting, and without much difficulty was able to produce a special primer that was several times as effective. The curves in Fig. 2 show quite emphatically the variation in effectiveness of the paints used. Averaging the results for hickory, oak, maple and birch, it took about six times as long for these test pieces to absorb an extra 6 per cent. of moisture when coated with the "special" as when coated with the standard "A." There is every reason to believe that much better results can be secured and with less than three coats. Preliminary tests with a casein solution indicate that it has water-proofing qualities, which, for some classes of protection, may be very valuable. The same is true of some of the pyroxalin compounds. Varnishes are in general more effective than paints, but in the protection of wheels its application was not suitable for primary coats.

Need for Research

What has been said so far shows the need for research work on this subject. Cabinet and furniture makers are vitally interested in a coating which will prevent wood from "working," shrinking and swelling, due to atmospheric changes in winter and summer. Interior woodwork could be greatly simplified if the dimensions of each particular piece of wood remained the same or varied but a very small amount. Flooring, decking, paneling, etc., would be greatly benefited if it did not "work." Many wooden structures would be simpler and more permanent if so protected, and with thoroughly dried timber they would either have a greater factor of safety or could be built with less lumber. Many other advantages will develop as thought is given to the subject—the dimensional stabilization of wood by rendering it moisture-proof to some substantial degree.

It is well known that shingles and weather boards fastened with old fashioned wrought-iron nails stay tight longer than those in which the modern steel nail is used. The reason for this is that the steel nail rusts and is flaked off by the movement, or "working," of the piece through which it is driven. A nail tightly driven is practically sealed against external moisture by its head and the paint around it; but if moisture reaches the nail by the capillary action of the wood fibers, it will rust in spite of end sealing. Then too, the moisture and capillarity of the wood cause the "working" that rubs off the layer of rust and exposes the nail to continuous corrosion. The working also abrades the wood and leaves the familiar large, rust-stained hole around an attenuated nail. The same conditions apply to the bolts and other steel fastenings in farm machinery, wagons, motor-truck bodies, and a long list of other articles. It is of vast importance in wood construction, therefore, that we have paints to protect the wood from absorbing moisture. Ordinary paint does not effectively do this except when a large number of coats is applied, and so far as the writer has been able to find out, there has been little or no attempt to produce a paint that will do it.

The Importance of a Layout Sketch

(Continued from page 60)

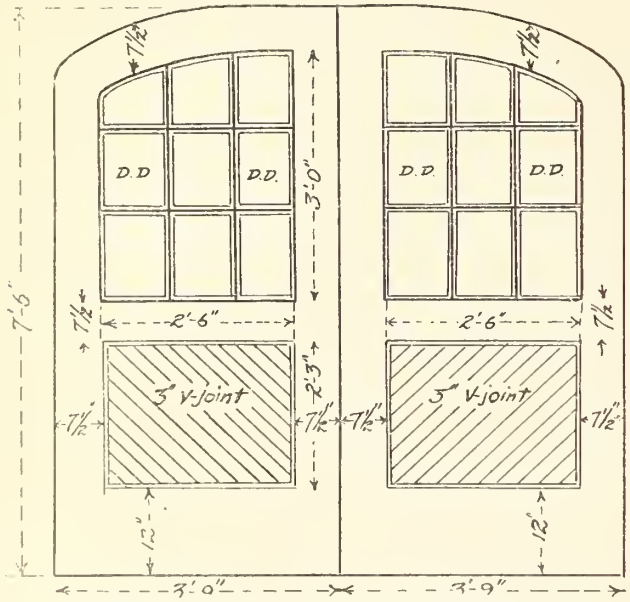
and disadvantages are shown in a sketch. It is possible to obtain a sketch or layouts like these of other plants and make a comparison on actual conditions as well as theoretical. And anyone who is checking up his dry kilns, even though not planning immediate action, will do well to get these for the sake of new ideas and helps which they often present.

Fig. 3, shows latest installation at Bloomington, Ind., plant of Showers Bros.' Furniture Co.

What is the Right Cost for Garage Doors?

Can a Difference of 144 Per Cent in the Estimated Cost be Justified?—Although the Job is Comparatively Simple, no Two Estimates Agree as to the Amount of Material Required

For this issue of the "Canadian Woodworker" a rather simpler job was selected for our cost study purposes, the idea being to pick out a piece of work that is more in line with what the average mill is accustomed to handle. On several occasions our contributors to this department, in sending in their figures, asked that we choose a job that was more ordinary and which was more like the work that was constantly running through their plants. We felt that the pair of garage doors illustrated met these requirements and consequently, we asked for estimates of the net cost of producing these, with results as shown in the accompanying table. It is very interesting to look over these figures and compare them, for there seems to be just as big a difference, or possibly more, as in the case of the more intricate jobs which we have used in some of these cost studies. It was rather



Ten millmen figured on this pair of garage doors. As shown in the accompanying table the cost was estimated to be anywhere from $23.69 to $57.84

expected that with a more standard line, estimated costs would show a smaller range of difference and that within close limits they would be nearly on a par. However, the fact that there is 144% variation between the low and high figures, with the others well distributed between, indicates that even on standard lines millmen are not yet well versed in figuring costs. Of course, it must be understood that some allowances must be made for the difference in conditions at different plants, for the different prices they have to pay for their lumber and their labor, etc., but notwithstanding all this there should not be the large discrepancies that have characterized practically all of these cost studies. Our contributors to this department apparently agree with this for we are constantly being assured by them that they realize how bad the situation is and are anxious to co-operate with us in trying to bring the facts before the millmen so that they may see the error of their ways and attempt to correct them. Just to show with what interest some millmen look upon this series of articles, we quote from the letter of one Ontario firm. "We take it," they say, "that the ten or twelve firms who are contributing are representative firms in Ontario. Would it not be a good move some time this winter to attempt to bring these firms together and endeavor to solve some of these problems together. The variations in estimates are out of all reason and it looks as if we were open for information along this line." While the firms that participate in these studies are not all Ontario firms, but are operating in some of the other provinces, it might be possible to bring together a sufficient number of firms in the same district to make a study of these problems. What do you think of the suggestion? If you are favorable, it might possibly be worked out.

144 Per Cent Difference

Taking up the garage door job specifically, it will be seen that the total cost, without profit, varies from

No.	Lumber	Waste	Bench Hrs.	Rate	Machine Hrs.	Rate	Commercial Burden	Total
1	$ 8.64	10%	4	.60	6	.90	30%	$23.69
2	7.41	25%	5	.80	5	1.25	20%	25.55
2a	13.21	15%	7	.87	3	1.13	20%	29.03
3	8.77	10%	8	.85	5½	1.50	20%	32.18
4	13.20	20%	9	.85	4	1.25	20%	34.61
5	10.50	25%	12	1.00	4	1.25	15%	34.85
6	12.82	20%	7	.90	8	1.20	20%	38.14
7	16.80	20%	11	.85	5	1.07	20%	43.40
8	16.61	20%	6	.80	8	1.50	20%	43.81
9	20.95	20%	13	1.00	9½	1.50	20%	57.84

$23.69 to $57.84, a difference of 144 per cent. The remaining figures are pretty well scattered between these two limits although the majority are between $32 and $38. In the particular items that go to make up the estimates, the amount of labor required shows quite a great variation. Bench hours, for example, vary from 4 to 13 and machine hours from 3 to 9½. On the matter of lumber there is quite an unnecessary difference in the number of feet that are estimated to be required on this job. The lowest estimator figures 84 feet net, while the highest figures 110 feet net. Surely the job is simple enough to enable estimators to take off their quantities with a reasonable degree of accuracy. Remember these are net figures without waste. For waste some figure as much as 25% and some as low as 10% although 20% seems to be the most prevalent figure.

We have repeatedly pointed out that commercial burden is a very important element in figuring costs and we have time and again urged our readers to take full cognizance of this factor and give it the rating that its importance deserves. In this instance 20% is the commercial burden rate in 7 cases out of 9, the other 2 being 15% and 30%, the 15% figure being much too low in our opinion. This factor of

commercial burden has to cover such a large number of items that it cannot be kept low and cover them adequately. We are never surprised to see high commercial burdens because we know that many plants operate in such a way that this factor is an unusually high one. Of course, in such a case it is up to the plant operator to make every attempt to keep his overhead down so that the burden factor will be as low as possible.

Need for Improvement

Judging the matter as a whole, we can draw from this particular study the same conclusions that have been formulated in our previous cost articles, viz., that millmen need to improve their practices with regard to figuring costs and need to make a more important study of the elements that enter into their costs so that they can estimate intelligently and with reasonable assurance of deriving a figure that will be as closely as possible equivalent to the actual cost of turning out the job. The Millwork Cost Bureau to which several Canadian firms belong, is doing a most excellent work along this line but whether you are members of the Millwork Cost Bureau or not, you can do considerable yourselves toward remedying the situation as far as you are concerned and thus pave the way for profits that are surer because they are based on an exact knowledge of what it costs to produce your goods.

We have deliberately left out a suggested cost study for next month as we would like to hear from our readers if they care to have these articles continued. They have been running now for practically a year and we hope that the lessons which they have been intended to teach have properly impressed themselves upon those who have taken part. At the same time if our readers would like us to continue these articles, we will gladly do so. But please let us have your opinion on the matter.

Differential Price List for Box Makers

A Method For Figuring the Sales Price of Box Shook that Will Allow of the Same Profit Irrespective of the Size of the Order—Will Assist Both Manufacturers and Buyers

The "differential price list" is a method for figuring the sales price of box shook which has recently been issued by the National Association of Box Manufacturers, Chicago. Briefly, the system will enable a man to sell any type or size of box, knowing that the same relative profit will be received whether the order consists of one, one hundred or more boxes. In a recent issue of the bulletin of the Association appears the following comment regarding the purpose and application of this differential price list.

All box manufacturers agree that while they may be making a profit on a certain line of orders, there are boxes or shook produced which, owing to complications in manufacture, size or quantity ordered, do not bring in the same profit, and in fact many times, when costs are figured, will actually show a loss. The use of the differential will eliminate the manufacturing of boxes at less than production cost. It gives the relative sales price for all orders regardless of size and whether one box or one thousand; it considers the amount of material in each shook and box, what should be the additional sales price for a small box as well as one of unusual size when compared with the box with the average feetage, or one of easy construction. It calls to the attention of the manufacturer the various small items that go to make up the cost of producing boxes, such as corrugated fasteners, printing, the changing of guides on account of small orders and tying of shook for delivery.

Once the list is installed in a manufacturer's sales department and customer's boxes are figured according to its rules, it eliminates the necessity of refiguring the cases when prices change on account of change in manufacturing costs or the cost of raw material.

The list price that will be placed on the card index carried by the manufacturer never changes. The discount to apply to that list price will change as conditions warrant. Once the list has been installed, it will simplify quotations, for all that is necessary is that the manufacturer determine the discount, and any clerk in the office knowing the discount can quote the price on any order with the assurance that the same relative profit is secured that has been considered necessary by the head of the department.

Its Use With the Customer

It is not necessary that the buyers of box shook be handed a copy of the differential list, although this can be done to the advantage of the manufacturer as well as the buyer. The cost of the differential has not yet been determined, but will likely be in the neighborhood of $5 per copy. Shook manufacturers using the differential list as a basis for making all quotations will find it to their advantage to give customers the list price on all shook they are likely to order. Such a letter will show the customer's box number and opposite the list price, which, as stated, never changes. After the customer has been advised of the list price, it would in the future be necessary only to give the customer the discount to apply to that list, which would allow him to figure the price of his shook. It would be an easy matter for the box manufacturer, once he has placed the list price on the various customers' boxes, to put out a weekly or monthly quotation sheet to his customers, such quotation sheet to merely give the discount in effect at time quotation is made.

Box manufacturers who have used the differential in the way outlined have found that the discount system of quotation is welcomed by the shook buyer.

Shows the Minimum Price

Possibly one of the most valuable features of the differential list is that it definitely shows the box manufacturer the minimum price that can be quoted and cover replacement costs, labor, overhead and all other items that go into the cost of shook production. This is of value in meeting competition. A plant that is efficiently organized and that can manufacture at a minimum cost will know that if business be lost to them, it has been taken by one not knowing costs.

therefore at a figure that means an actual loss to the successful (?) bidder.

There is a wider range in the profit received on the individual sizes furnished by box manufacturers and where buyer requests quotations on a relatively large list, the manufacturer of shook figuring on that list will find that the actual profit per size will vary to a large extent. The differential list changes that condition so that the relative profit on each size in an order will bear its proper percentage of profit.

In figuring in competition with manufacturers not using the differential list, there is no question but what if the competition be severe the bidder using the list would receive a certain part of the order, the balance going to other factories, and upon analysis the manufacturer using the list would find that he had taken the profitable part of the business.

There are many ways in which the differential price list can be used to the advantage of both buyer and seller.

In issuing the differential price list the association realized that additions would be made from time to time to cover conditions that would arise in the industry. For that reason the list has been issued in loose-leaf form, so that any page can be corrected without destroying the book, and additions can be made as found necessary.

The association will keep a permanent record of its distribution, so that when changes or additions are made it will be possible for each owner of a list to receive the changes and to know at all times that his book is up to date.

Should the Lumber Manufacturer Make Box Shooks?

The competition that box makers have to contend with when lumber manufacturers attempt to market shooks was characterized as very harmful by L. F. Powell, president of the Box and Shook Makers Association, in the course of an address to the North Carolina Pine Box and Shook Manufacturers Association. Mr. Powell's remarks in this connection were:—

"I grant you that the lumber manufacturer or anyone else has a perfect right to make boxes, but before doing so they should acquaint themselves, first, with the methods of making boxes; second, with the methods of figuring accurately the contents of a box and, third, the method of arriving at the actual cost of producing a box. If they will watch these points we would not have the indiscriminate and ridiculously low prices that are being made to-day by some of our lumber manufacturers who are attempting to sell box shook.

"When a lumber manufacturer goes into the shook market and offers a shook at a lower price than it can be made and sold at a profit, he is not merely hurting the box manufacturer, but is also cutting at the throat of his fellow lumber manufacturer, because it soon becomes generally known throughout the territory in which he sells that a new price has been established on a certain standard box, and every buyer at once begins to hammer the shook manufacturer down to that point or below, with the result that the shook manufacturer is forced to do one of three things: Reduce his price to meet this unfair competition, or continue to make the box at a loss, or else give the customer an inferior package, either one of which cannot stand. I have never felt that it is fair to the trade, nor to our industries, for experienced lumber manufacturers to attempt to market their low grade lumber by manufacturing it into shook. I am certain that no lumber manufacturer has ever made, but on the other hand has lost, money through such venture.

"In mentioning this phase of the lumber business, I wish to make it clear that I have no personal grievance against any lumber manufacturer who is making shook. I am looking at it from the broad standpoint of the industry as a whole, and I believe it will be agreed that it is harmful to both the lumber and box manufacturers."

W. M. Pryor Heads W.M. Ritter Lumber Co.

At a meeting of the directors of the W. M. Ritter Lumber Company, held in Columbus, Ohio, recently, W. M. Pryor was elected president of the company succeeding W. M. Ritter, the founder of the Company, who has been its president since its organization more than twenty years ago. At the same meeting, Mr. Ritter was elected to the newly created office of chairman of the board.

This change in the corporate organization of the company does not mean that Mr. Ritter will be less

Mr. W. M. Pryor

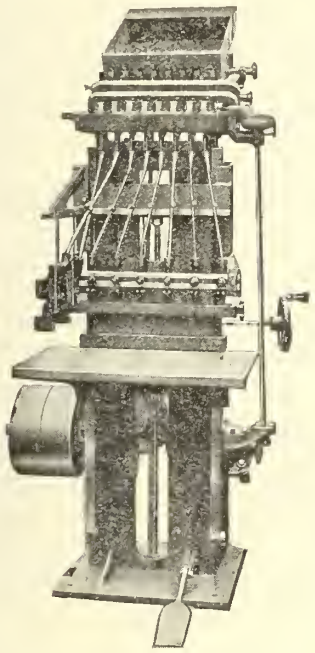
active in directing the policies of the company. The change has been made at his request to the end that he may be partially relieved of executive duties, which, by reason of the rapid growth and expansion of the company, and the multiplicity of his other interests, have become burdensome to him.

The new president of the company is 44 years of age and has been in the service of Ritter interests for more than twenty-five years, during which time he has served in almost every capacity connected with the business, and for the past five years has occupied the position of assistant to the president. He will be remembered by many as traveller in Canada some years ago for the Ritter organization.

Machinery & Equipment

Scotch Box Nailing Machines

It is now possible to procure in this country the well-known box nailing machines made by Matthew Wylie & Co., Limited, of Glasgow, Scotland, who are now prepared to meet any demands that the Canadian trade may develop in this connection. The products of this firm, which include box nailing and cleating machines of all descriptions, have established an enviable reputation in the Old Country and should appeal to Canadian buyers in the box machinery market. The Matthew Wylie line includes machines of all sizes and capacities for plain or zigzag nailing. They are said to be especially easy of operation, entirely automatic and instantly adjustable. A typical nailing machine is shown in the illustration. Those interested will receive a catalogue on request.

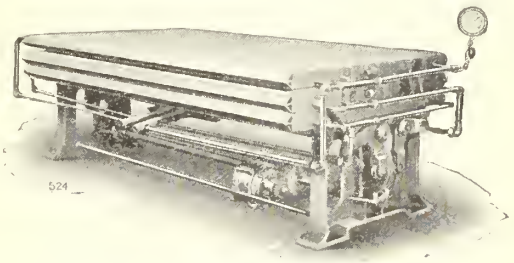


One of the Matthew Wylie line of box nailing machines

Merit Veneer Re-Drier Made in Canada

Canadian woodworkers will be interested to know that Cowan & Co., of Galt, Limited, Galt, Ont., are now making and selling in Canada, under license from the Merritt Engineering & Sales Co., Lockport, N. Y., the well-known "Merit" three plate veneer re-drier. This machine, illustrated herewith, is a horizontal hot plate press in which the heat of the plates converts the sap and water of the wood into steam and the press action holds the sheets flat while they dry out. The pressure upon the veneer is the weight of the plate above it and this is lifted periodically by a power "breathing movement" which forcibly expels moist air and gives opportunity for the veneer to shrink.

The machines are used for drying green veneer for centre stock and for re-drying and flattening veneer for the glue press. The heat is applied uniformly to both sides of the veneer and the edges and ends of a sheet dry no faster than the centre. No checks or splits are produced. The surface cannot become dry or case hardened while there is a particle of moisture inside the wood to be converted into steam and come to the surface.

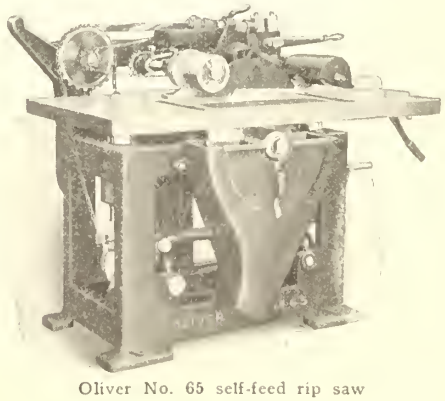


The Merit veneer re-drier made by Cowan & Co.

The machine is electrically driven and is piped for connection with the factory steam line. It is designed for plants having need of a re-drier of moderate cost and of limited capacity. Three sizes are built; No. 1, 2 and 3, having plate sizes 100 in. x 52 in., 84 in. x 54 in. and 72 in. x 36 in. respectively.

Oliver Self Feed Rip Saw

The accompanying illustration shows the No. 65 self-feed rip saw brought out by the Oliver Machinery Co., Grand Rapids, Mich., and which is claimed to be an improvement over other self-feed or power feed rip saws, in its safety features and in the dust chute for easy connection to the exhaust system. The machine is designed for ripping all kinds of lumber and is adaptable to the ripping of rough stock as well as finished stock and is recommended to the operators of mills and shops handling stock in quantity. The saw arbor is mounted on a frame, the frame having vertically adjustable table with an in-feed spur roller made corrugated or smooth according to the requirements of the work going into the machine. This roller carries the stock through the saw and across the top of table.



Oliver No. 65 self-feed rip saw

The machine will take saws up to 18 inches in

diameter and will cut up to 5 inches thick or rip up to 24inches wide. A gang of six saws with 1 inch space collars may be used at one time. Indeed, the machine might be called a gang rip saw. There are three rates of feed, 80, 110 and 140 feet per minute. Some of the special features claimed for this machine are as follows: Quick acting adjustment to feed rollers; quick action to adjustment of and locking of ripping fence; quick raising and lowering adjustment of table; has three powerful and rapid feeds, 80 feet, 110 feet and 140 feet per minute; will take stock having 3/4 inch difference in thickness without readjusting feed rolls; has outside bearing on drive side of machine; has mechanism for absorbing shock on the feed rolls, which overcome any jerks on starting the stock through the machine.

Careful attention has been paid to the safety feature of this machine. The lower portion of the saw is thoroughly guarded by means of the dust chute and the cover; the upper portion runs in a guard carried by the feed mechanism.

The table is 33-1/2 inches by 56 inches, vertically adjusted by a lever locking cam. The saw arbor has self lubricating chambers. The machine may be arranged for motor drive by placing the motor in place of the countershaft.

Information and Inquiries

You are cordially invited to make use of this department

Doll Carriage Gearings

68 St. Andrews St.,
Galt, Ont., Sept. 18 1922

Editor, "Canadian Woodworker,"

Can you inform me of the names of firms that manufacture the gearings for doll buggies?

Thanking you for your trouble, I remain

Yours very truly,
A. C. Johnston.

The E. R. Wagner Co., North Milwaukee, Wis., and the H. N. Thayer Co., Erie, Pa., are firms that specialize in the manufacture of gearings. The Gendron Manufacturing Co. Ltd., 137 Duchess St., Toronto, Ont., may be able to supply your needs although they make the equipment primarily for their own use.

Wants Three-Eighth-Inch Wooden Balls

74 Niagara Street
Hamilton, Ont., Oct. 17, 1922

Editor, "Canadian Woodworker."

Can you furnish me with the name and address of a firm that can supply me with 3/8 inch wooden balls. I fail to find the same advertised in your "Canadian Woodworker & Furniture Manufacturer," but have heard that there is a firm somewhere in Toronto.

If you can oblidge me, your service will be greatly appreciated.

Yours truly,
Edward Earl.

The following Toronto firms can supply balls of the type specified, provided that a sufficient quantity is wanted to justify their turning out the work: Ontario Handle Co., 411 Manning Chambers; Ewing and Murphy, 18 Cameron St.; Kerr and Brown, 1536 Dundas St., West; H. E. Hunt, 337 Leslie St. Among the firms outside of Toronto that can meet your requirements are the Canada Wood Specialty Co., Orillia, Ont.; J. H. Connor and Son, Ottawa, Ont., and Wood Turning Products Ltd., Fenelon Falls, Ont.

Manufacturers of Veneers in Canada

Orange, Mass., U. S. A.
October 17. 1922

Editor, "Canadian Woodworker,"

Can you advise us where we could obtain a list of the manufacturers of veneer in Canada? Please accept our thanks in advance for any information you can supply.

Yours very truly
Rodney Hunt Machine Co.

There are only three manufacturers of veneers in Canada as far as we are aware. They are the Waterville Veneer and Panel Co., Waterville P. Q.; Guelph Patent Cask Co., Scotstown, P. Q., and Sam Lacaille, Nominingue, P. Q.

Dealers in Rattan and Cane Products

Windsor, Ont.,
Oct. 17, 1922.

Editor, "Canadian Woodworker."

Please tell us where we can procure rattan and cane products in Canada or any books pertaining to rattan or reed work for furniture.

Yours truly,
R. S. Buckwell.

The E. T. Carter and Co. Ltd., 84 Front St., East, Toronto, carry a full line of rattan and cane products and will probably be able to fill your requirements. We do not know of any text books dealing with rattan or reed work. Possibly some of our readers can help us out.

Cost System for Woodworking Plants

Montreal, P. Q.,
October 13th. 1922.

Editor, "Canadian Woodworker,"

A client of ours has asked for information in connection with a system of costs accounting for sash, door and wood-working factories. We are writing to know if you have anything on the subject or can advise us where such can be obtained.

Yours very truly,
Stinson-Reeb Builders' Supply Co.

It is possible that you may get the information you desire regarding a cost system from Carle M. Bigelow's treatise entitled "Installing Management in Woodworking Plants," in which book about sixty pages are devoted to cost accounting. This book may be obtained from the publishers, the Engineering Magazine Co., of New York or through the "Canadian Woodworker." Your client may also be benefited by reading the articles that have frequently appeared in the "Canadian Woodworker" on this subject. A perusal of back files will disclose much information relating to cost systems. We also suggest your getting in touch with the Millwork Cost Bureau, 605 North Michigan Ave., Chicago, which is an organization aiming to improve the status of costing in the millwork industry. They will be glad, we are sure, to explain their objects and the system which they recommend.

Upholstering and Trimming

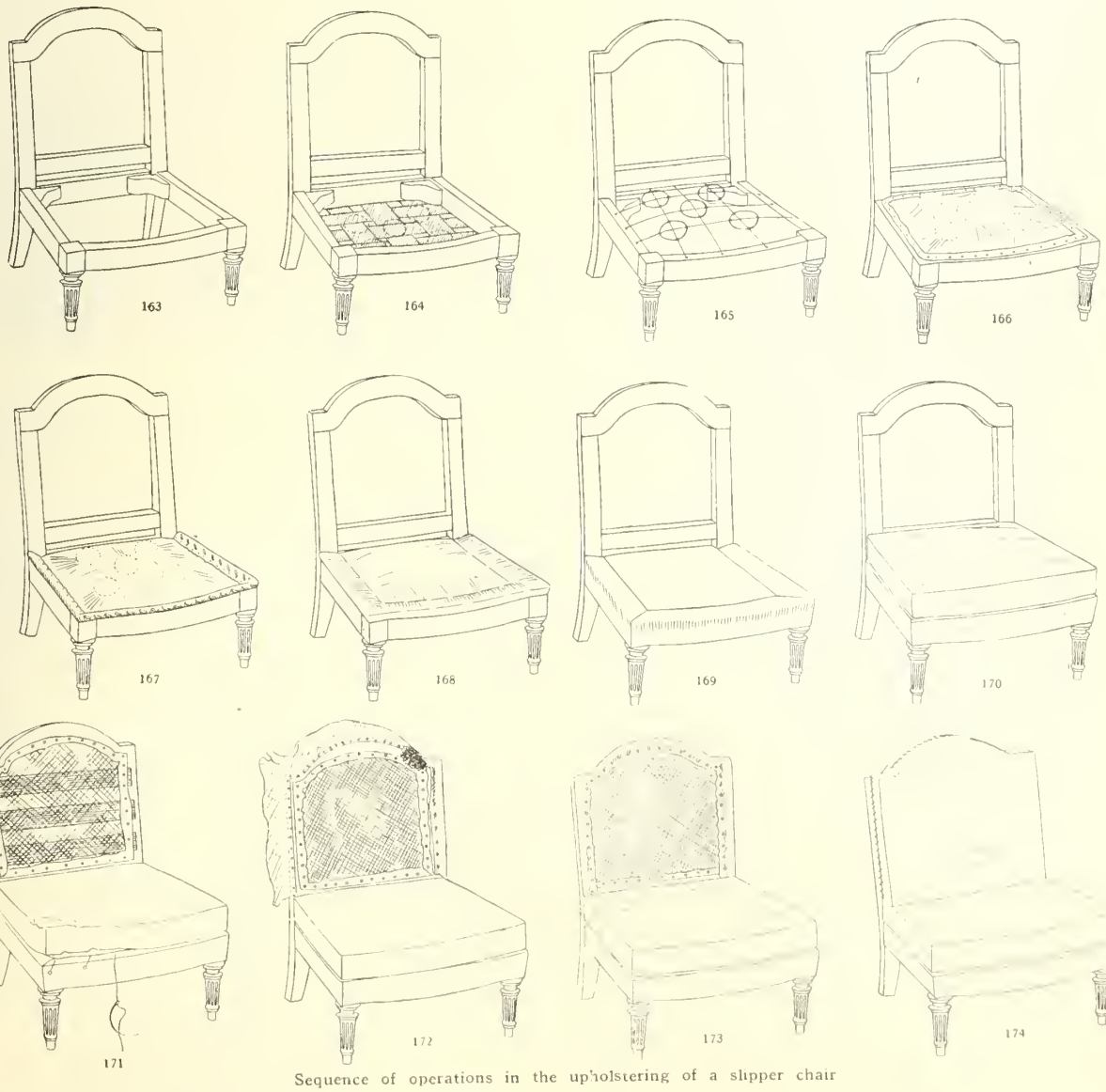
Method of Upholstering a Slipper Chair

Low Seated Piece Requires a Treatment Especially Suited to its Particular Use and Proportions

While there is a great similarity in the treatment of all chairs with down cushions irrespective of their shape, there are certain individual pieces which require a treatment distinctly adapted to their own use and proportions. Of this description is the slipper chair, the frame of which is illustrated in Fig. 163, and the upholstery of which is described in "The Upholsterer."

This chair is particularly used for boudoir purposes and is kept always very low, the seat being not over fourteen inches from the floor. This chair is treated as an ordinary spring seat, being webbed in the usual way for five springs as shown in Figs. 164, 165 and 166.

Canvas or canton flannel for the nosing is next tacked around the front and two sides of the chair and back-tacked on the top of the rail close to the front edge, stuffed up and tacked on the top of the rail as shown in Fig. 167. The edge thus formed may be stitched as indicated, after which a light coating of hair is placed over the springs and the whole covered in muslin as shown in Fig. 168. In this figure it will be noticed that we have indicated the stitching down of the muslin to the canvas so as to provide a

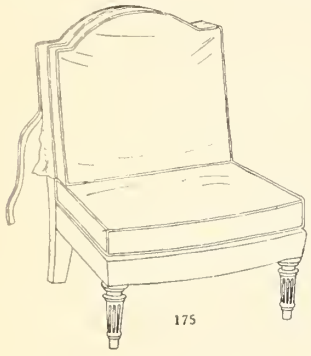


Sequence of operations in the upholstering of a slipper chair

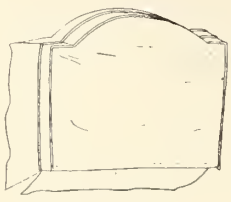
dip about 4 inches from the edge of the chair, which will compensate for the rounding of the bottom of the cushion.

A piece of covering, sufficient to make a complete border is back sewed at the point of this stitching as shown in Fig. 169 and the entire border covered in the usual way.

The centre of the seat may be left in the muslin because for this chair, as will be shown in the next



175



176

stage, the cushion is not intended to be removable. After the cushion has been made and covered after the method previously described in connection with down cushions, it is fitted into place on the seat and the bottom of the cushion is blind stitched to the fabric which covers the nosing. The stitching should be 2 or 3 inches in from the edge of the cushion in order that the cushion may appear to lie on the chair of its own weight and not reveal the fact that it is confined by sewing. The border of the seat cushion is not over 2¼ to 2½ inches high, therefore stitching 2½ inches in from the edge will be quite sufficient.

Also in Fig. 171 the back of the chair is shown canvassed with three strips of webbing across, which provides the foundation for the back cushion, the webbing and canvas both being attached to the front or face of the frame. A piece of canvas or canton flannel is now back-tacked around the three outside edges and tacked in the same way as was suggested for the seat, and a nosing not over 1 inch high is stuffed up as indicated in Figs. 172 and 173.

This nosing may be stitched or not, according to the way in which the nosing has been filled up. The back cushion is now made about 2 inches thick, pattern being taken so as to make a good fit, of the shape of the back. After filling it is sewn all around to the edge of the nosing as indicated in Fig. 174.

The cover is next constructed in the manner already explained in connection with other chairs, the border being piped. In addition to the width of the border, a strip about 3 inches is also provided to act as a second border and cover the edge of the frame.

A welt is provided where this extra fabric joins the cushion as well as a welt on the face of the cushion. The cushion cover is built into place over the cushion, and if desired may be very lightly attached to the nosing in the same manner as the cushion is attached, turning back the surplus cover of course and sewing from underneath.

The final operation consists of padding the edge of the frame and nosing with a layer of wadding and the fabric which has been attached to the cushion for the purpose, serves as a back border and is now tacked into place and the cover welt is also tacked on the outside back at the edge of the frame, so as to give the appearance indicated in Fig. 176 of the double back cushion.

How Upholstery Leathers Are Manufactured

The Various Processes in the Production of Fine Grade Leathers for Furniture Use—What Constitutes Good Leather

By Julian B. Hatton*

The art of making leather may be traced back to the remotest periods of the early civilizations. The Chinese, the Egyptians, the Babylonians, the Persians, the Greeks and the Romans all possessed some skill in tanning. Probably the first method was sun or smoke drying, and treatment by fats and oils such as our own American Indians used. The Egyptians were very deft at finishing leather and were skilled in dyeing, embossing, painting and gilding leather. Some of their product still exists, although manufactured as long ago as 1000 B. C. This demonstrates why genuine leather always pays for its installation and why tanners claim "there is nothing like leather."

In choosing hides for upholstery leather, the Western packer steers are generally selected as they are large and spready and free from butcher cuts. During the war these hides rose in price from 12 cents to 52 cents per pound. They have now dropped and the price of leather has also declined, until it is undoubtedly the cheapest basic commodity.

To change from a thick heavy steer hide covered with hair and salt and liable to putrefaction if not taken care of, to a clean, soft and durable piece of leather with a handsome finish is a process requiring many operations and much careful handling. The big packers are a great source of supply to the tanners and from them the leather companies buy many thousands of hides yearly.

The hides are delivered to the hide house in carload lots of 800 or more, each being separately bundled. In the hide house they are unrolled and trimmed of all the long shanks, the tail and head. They are next taken to the beam house and thrown into paddles of clean cold water and cleansed of all dirt, manure and salt. They are then fleshed by being thrown into a fleshing machine, a machine with a spiral knife roll, which closes down on the hide and scrapes off all loose flesh and fat. These fleshings and the trimmings from the hide house are sold as glue stock. The next operation is the important one of loosening the hair from the hide. This is done by soaking in vats of hydrated lime strengthened by sodium sulphate. The hair roots are destroyed and by means of a dull-knifed machine similar to the flesher, the hair is scraped clean. The hair is sold as an important by-product. The hides are at this stage swelled by lime and must be bated to make them soft. Bate is an acid chemical which neutralizes the lime and makes the hides soft and pliable.

The Tanning Operation

Up to this stage this stock is still decomposable

*The Eagle-Ottawa Leather Co., Grand Haven Mich.

(Continued on page 92)

Eagle-Ottawa Leather Co.

TANNERS OF

FURNITURE LEATHER

OF EVERY DESCRIPTION

We are making a specialty of cutting

Spanish Split Leather for Chair Manufacturers

Quotations and samples furnished on application

We will be pleased to supply a very attractive sample book, of all our grades on application.

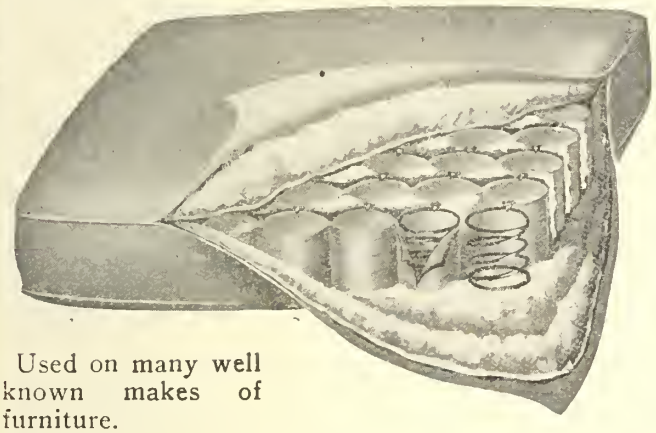
GRAND HAVEN - - - - - MICHIGAN

"COMFY" CUSHION COMPANY

Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.



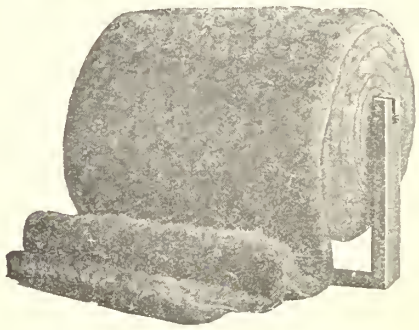
Used on many well known makes of furniture.

Write for Catalogue

"Comfy" Cushion Co.

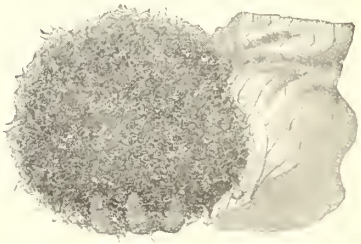
340 Gerrard Street, East, TORONTO, Can.

Woven Curled Hair



LOOSE-CURLED HAIR

In All Grades and Colors



Samples Cheerfully Furnished

BLOCKSOM & COMPANY

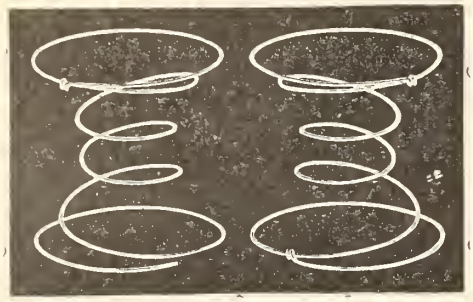
Sterilized Curled Hair

MICHIGAN CITY, INDIANA

Here's a Suggestion

Do you ever try keeping a file of your back copies of the "Canadian Woodworker"? Try it. Start with this issue. There are many articles that are worth keeping, as they offer valuable suggestions that will help you in your business.

"IDEAL"
FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,
of Canada, Limited
Windsor - Ontario

MARIETTA WOOD AND METAL FINISH SPECIALISTS

Durability and Beauty Are the Outstanding Qualities of MARIETTA ENDURANCE ENAMELS

They are made of the very finest materials and are noted for their practical working qualities.

We make enamels in a variety of grades to suit the requirements of many furniture manufacturers.

Any color desired.

The Marietta Paint and Color Co.
Marietta, Ohio
Southern Factory - High Point, N. C.

"Save the surface and you save all"—*Paint & Varnish*

D&P

QUALITY

CURLED HAIR GLUE SANDPAPER
DELANY & PETTIT LIMITED
TORONTO.

OFFICE
133 JEFFERSON AVE.

WORKS
JEFFERSON & ATLANTIC

New Finishes Popularize Bird's Eye Maple

Furniture of This Wood is Now in More Demand Owing to the Vogue for Deep Browns

By C. J. La Vallee*

It is quite interesting to notice just now quite a decided trend on the part of furniture makers to use bird's-eye maple once more. This wood was quite largely used and became very popular years ago, but at that time it was not shown in any colors except the purely natural and such delicate shades as the lightest of silver grays and greens.

From the manufacturers' standpoint, the use of the wood at that time was not completely satisfactory because of its tendency to rapidly turn yellow after it was away from the factory only a short time. On this account only the very choicest of woods, both as regards color and figure, could be used. So much care had to be exercised in the selection of the wood that the resulting furniture was very expensive. From the standpoint of the home owner, there was a disadvantage in the use of bird's-eye maple furniture because the very light finishes did not blend in with anything else and one was compelled to either furnish a whole room in bird's-eye maple or not use it at all. These two disadvantages, coupled with the fact that the finer grades of wood were continually getting scarcer, undoubtedly had a far-reaching effect in minimizing the popularity of bird's-eye maple as a furniture wood.

Brown Finish is Much in Demand

Now it appears that there is quite a demand for some of the new and beautiful browns on bird's-eye maple, and since some of this furniture has been brought out and the buying public are finding that such pieces lend themselves to most artistic blending with fumed, the rich shades of brown mahogany, American walnut, etc., there will undoubtedly be a large sale of such furniture. It is apparent that bird's-eye maple finished in the rich, deep browns in vogue at the present time will at once overcome the disadvantages mentioned by the writer, viz., the turning yellow and inability to blend with other pieces, and will enable this most beautiful of American woods to take its place in the scheme of the quiet, toneful and restful home where good taste is displayed.

The wood itself from the standpoint of wood finish manufacturers forms an interesting subject for experimental work as a large variety of color effects can be produced, and with the silky undertone characteristic of this wood form combinations of the greatest beauty. The stains used for this purpose are of a type which will insure permanency of color, viz., the metal alkali and acid stains. We believe that the come-back being shown on bird's-eye maple wood is going to result in its having a permanent place among the native woods used in the making of fine furniture, and it should be welcomed back to its rightful place as a most artistic home furnishing material and should receive the consideration it deserves as a most useful and durable furniture wood.

*President, Marietta Paint and Color Co., Marietta, Ohio.

Have Your Finish Extra Nice

Here's a tip to people makin'
Things of metal or of wood,
You can carry home the bacon
If you have your finish good.
You can make each product pay,
If your finish is O. K.

You may build it like Gibraltar,
Your construction standards high;
Yet the customer will falter
And go somewhere else to buy—
Retail clerks fall down on sales—
Just because your finish fails.

So remember the compelling
Force of filler-varnish-stain.
For your finisher is selling
When he beautifies the grain.
You can always get the price,
With your finish extra nice.

The Marietta Message

Flint Varnish and Color Works Erect a Lacquer and Enamel Plant

In order to cater to the ever increasing demand for lacquers and pyroxylin products in general, the Flint Varnish and Color Works of Canada, Ltd., have erected at West Toronto, Ont., a modern plant fully equipped with the latest machinery and devices for the manufacture of their products from the basic raw materials. This plant will fill a long-felt want in that Canadian trade as, in many instances heretofore, lacquers have had to be imported from other lands.

The Flint line embraces such products as metal lacquers, wood lacquers, bronzing liquids, split leather solutions, waterproof belting cements, and in fact, it is understood they are in a position to match any of the imported articles of this character.

The plant has in addition technical laboratories which are equipped to render such service to their service department as is necessary to demonstrate their products in a practical way to the Canadian manufacturer.

Keep Up-to-Date

The only safety for any business, no matter how successful, is in keeping up to date. "Keep marching," must be the motto. Success keeps step with the time—and times change.

Building up a Demand for Decorated Goods

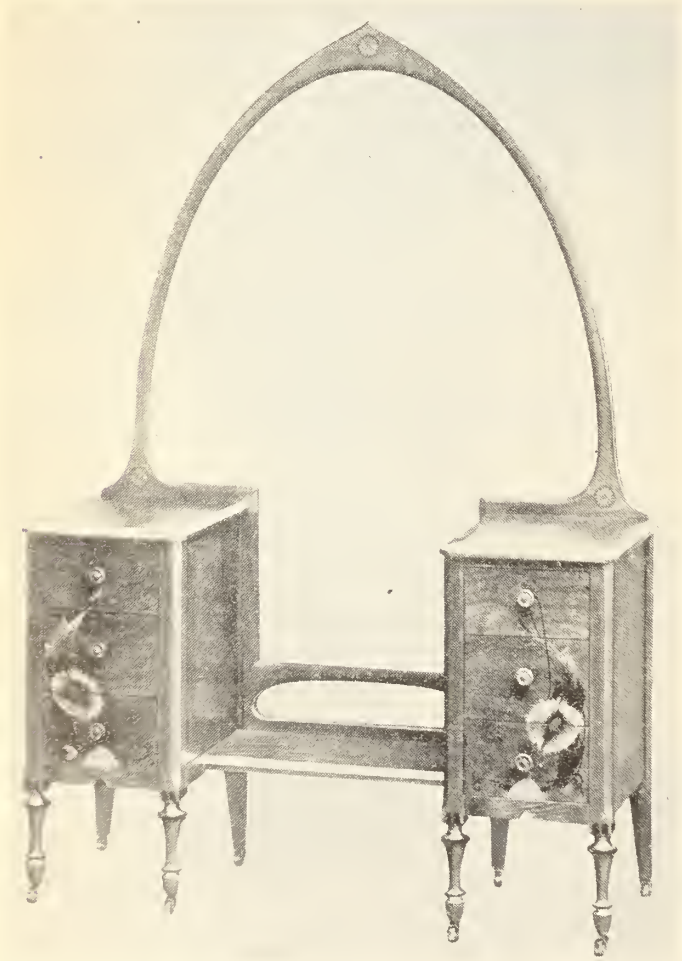
How a Firm Specializing in High-Class Furniture Has Achieved Success—The Finishing Department is a Veritable Art Studio

The vogue for decorative furniture and the appeal which it makes to artistic and discriminate buyers lends special interest to a description of a plant where exceptionally high grade lines of this kind are produced. While the furniture turned out by this plant is of a high artistic order, there are other features of the factory and its organization that are worthy of mention. These will come out as the article proceeds.

In 1916, two men of much experience in building furniture for the other fellow in Jamestown, N. Y., and possessing a splendid appreciation of the vast importance and the great influence of beautiful furniture in the home—two men with an ideal—Oscar R. Pang and Theodore G. Shellberg, organized the Nypenn Furniture Co. The company was established at Warren, Pa., in a small but advantageously located building formerly used for furniture manufacture and now a plant most modernly equipped for every operation from the handling of the raw material to the finished pieces of the woodworker's art.

Nypenn has in the short period of six years become synonymous with good furniture. The company's trade-mark which the workmen religiously live up to is the T-square surmounted by the triangle. The T-square is the tool of the craftsman for building correctly and conscientiously and the triangle emblematic as the apex of achievement. The trade-mark mentioned incidentally as an instance of the thought given the various details of this business.

How to have attained in so comparatively short time a recognized position in the furniture world for the excellency of its product is attributed to the one commanding principle of co-operation. This thought of co-operation is shown in the management's always assuming a most just and liberal attitude towards its employees—a policy which is not only good business acumen but, in some degree, a good manifestation that business is not entirely material but that the character of the men higher up has a most benefical effect on the morale of the worker.



Two pieces of an especially attractive decorated suite made by the Nypenn Furniture Co. They are of antique, grey walnut finish with wide silver bands and gold and black striping. Poppy motif in the decoration illuminated somewhat in the manner of old manuscripts. The draw pulls are especially interesting in that they form an essential unit in the decoration. The overlays on the base "lines" repeat the line of the mirrors, thus making for an harmonious composition.

This attitude as co-workers for a common ideal is practically evidenced by the fact that, without any expense or preliminary examination, all workmen on entering the employ of the company are given at the end of six months, life insurance in sums ranging according to their ages from $500 to $750 which increases each year up to $1,500.

Workers Encouraged to Buy Stock

The encouragement of workmen to buy stock in the company has proven a most effective way to bring about good work and the employer further demonstrates this liberal attitude by giving employees

(Continued on page 78)

A Better FINISH

You can improve the appearance and durability of your finishes and increase the saleability of your furniture by using

Cosmos High Grade Lacquers and Lacquer Enamels

Lacquer gives a permanent, waterproof surface that is tough and durable.

It dries rapidly, increasing the output of the finishing department. Successive coats may be applied at half-hour intervals, enabling work to be finished in one day.

Samples, prices and other particulars gladly furnished.

Our Specialties:

METAL LACQUERS
WOOD LACQUERS
ENAMELS
BRONZING LIQUIDS
EUREKA AIR BRUSHES
AMYL-ACETATE
REFINED FUSEL OIL
COLLODION
BRONZE POWDERS
MATCHLESS METAL POLISHES AND BUFFING COMPOSITIONS
BANANA OIL

Cosmos Chemical Company
Port Hope Ontario

The
ORIENTAL TEXTILES COMPANY
LIMITED
Oshawa, Ontario

Manufacturers of
Upholstery
Mohair
Velours and
Brocaded Mohairs

Agent
J. H. ALLEN
33 MELINDA STREET
TORONTO

Building up a Demand for Decorated Goods

(Continued from page 76)

a yearly bonus. All this has made able, loyal and interested workers who naturally reciprocate by each man giving his utmost in quantity and quality of production. Active figures show that the output of the plant is in many instances equal to some with twice the number employed, and the company, appreciating that business is really more than a matter of mere capital and factories, considers this loyalty and interest on the workmen's parts, it's greatest asset.

The great demand for the company's line of merchandise has necessitated the planning of another addition to the plant to be used for the production of the decorated suites and will be the third substantial addition since organization.

This enormous demand also brought about the somewhat forcible realization that this department of the business was not good enough. Thus, at the beginning of the current year Willem Dieperink Langereis was added to the staff as designer and general director. This artist is known throughout the country for his cleverness and originality and his consummate skill in the applied arts. In his various magazine articles on the applied arts and, especially those on furniture, there has always been an eloquent appeal for the artistic and practical.

A number of the reproductions here given and, especially of the Patrician suite, the Nypenn's most recent creation and a magnificent specimen of line and color, will more amply speak for what line and balance imply as applied to furniture, and this suite is truly an embodiment of the company's slogan.

Distinctive Decorative Designs

The past and present successes of the company undoubtedly auger a brilliant future for success is founded on the realization of the fact that employer and employee do not exist independently, but are co-existent and that success or failure must come to each in equal measure.

When the saw begins to burn the wood it means either more set or the front of the teeth should be ground back to get sharp edges on the teeth.

Spread the material you are applying, evenly over the surface; cross diagonally so that it lies even and finish with a light stroke.

CHINESE HOLLAND GERMAN

REEDS

These reeds are in all grades and immediate shipment can be made from Toronto, New York or point of origin.
We can also supply you with Rattans Turpentine, Cotton Linters and Cotton Waste at very attractive prices. Get our quotations today.

E. T. CARTER & CO., LIMITED
84 FRONT ST. E., TORONTO

The wood finish that resists the effects of HEAT

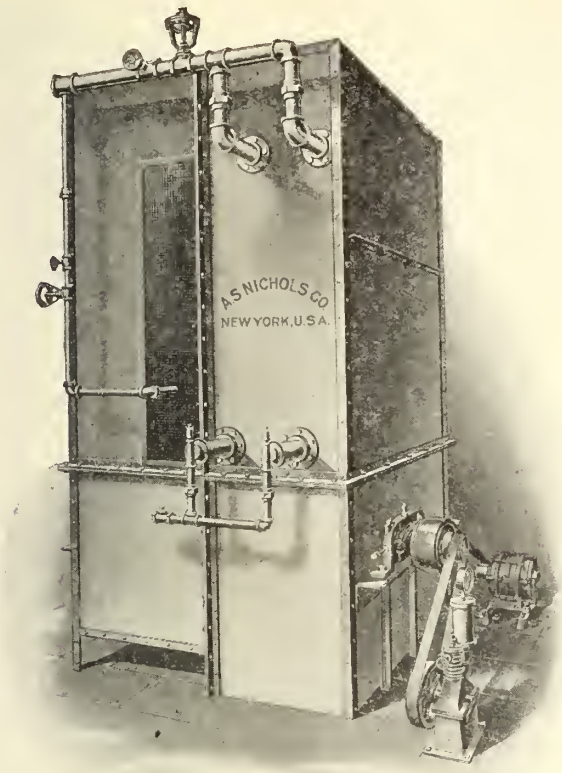
The heat that would blister any ordinary form of wood finish will not affect ZAPONITE—the Pioneer Wood Lacquer.

Besides possessing this advantage, hitherto unknown in wood finishes, ZAPONITE provides the additional advantages of being proof against moisture, checking, cracking and crazing.

Let our Service Division help you determine how ZAPONITE can be used in finishing your products at a SAVING in your production costs. Write us about this service TODAY.

Celluloid Zapon Company
200 Fifth Avenue, New York City
Branches: New Haven, Los Angeles, Philadelphia

THE PIONEER ZAPONITE WOOD LACQUER



Vertical Equipment Floor Space 4 x 6 ft.
Crated and shipped complete ready to set on the floor outside of your varnish room

YOU ARE PAYING FOR THIS EQUIPMENT—

while using old fashioned Varnish Drying methods.

The money you are losing will more than pay for this equipment in one year.

This statement is based upon a fact well known to manufacturers in every branch of the woodworking industry.

IT IS A COMPLETE UNIT of fan, motor, heaters, air compressor, with automatic humidity and temperature control.
is manufactured in sizes suitable to all requirements, both vertical and horizontal.
eliminates dust and dirt by the use of a new humidifying air washer without the use of sprayheads, pump and pipe connections.
will triple the output of your finishing rooms—practically eliminates sanding.
will decrease congestion in your factory.
will reduce investment of goods in process.
will improve working conditions for your employees.

"SET IT OUTSIDE YOUR VARNISH ROOM"

A. S. NICHOLS COMPANY

Aeolian Hall 33 W. 42nd St., New York City

Manufacturers of dryers for lumber, veneers, glued stock, varnish, paints, enamels, etc.

Increasing speed and reducing costs, while making certain highest quality work, in your finishing room with the

DeVilbiss
Spray-painting System

Whether you manufacture phonograph cabinets or chairs, metal cabinets or brass beds; whether you varnish enamel or lacquer those products, one DeVilbiss spray operator will do 4 or 5 times as much work as a brush finisher in the same time.

On every class and grade of work the sprayed-coating will be of highest uniform quality—free from brush marks, runs, fatty edges and like faults.

DeVilbiss exhausting equipment will insure a clean, healthful place in which to work, and reduce the fire hazard.

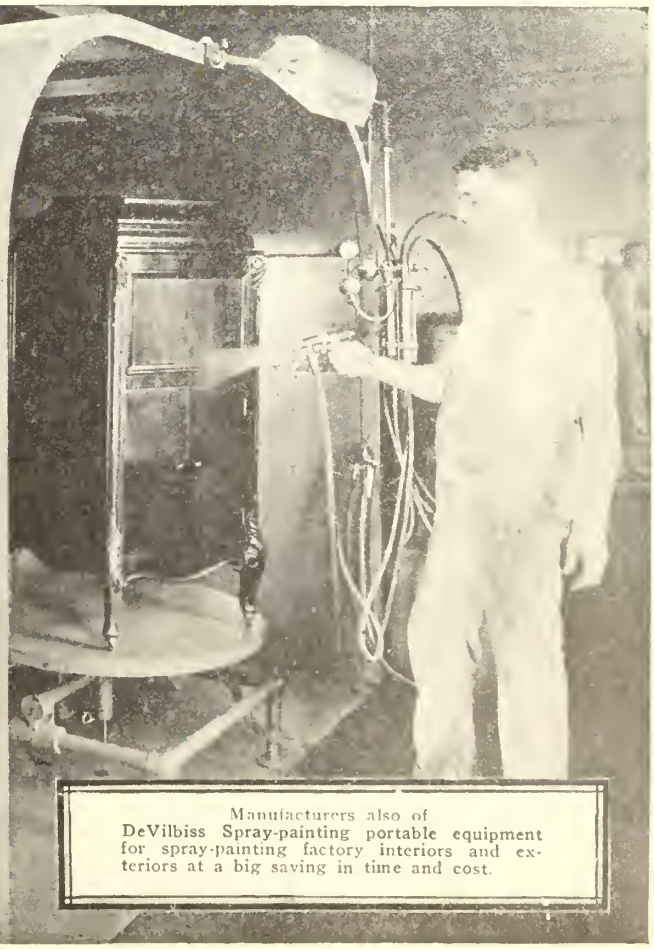
The outfit will be on the job every day, and cost little to operate and keep up.

These savings and advantages can be had in your finishing room, in the same profitable degree they are now enjoyed in thousands of wood and metal-working plants of every kind.

Let us mail you further particulars that meet your individual requirements

The DeVilbiss Mfg. Co.

3718 Detroit Ave. *Toledo, Ohio, U.S.A.*



Manufacturers also of
DeVilbiss Spray-painting portable equipment for spray-painting factory interiors and exteriors at a big saving in time and cost.

BeVeCo VENEERS

A Brand New Finish

"Brown Bird's-Eye Maple"

Featured at the Markets

HAVE you seen this beautiful new finish? Has your foreman obtained the sample panel which will be sent to you absolutely free?

Do not confuse this new shade of rich, warm brown with anything that has been used before. **Brown Bird's-Eye** is the result of a master craftsman's experience and effort. When you have seen it you will know why it has been so enthusiastically received wherever it has been shown.

Bedroom suites, novelty furniture, two-tone effects and decorative panels take on new life when **Brown Bird's-Eye** is used. It is particularly striking for inlays, overlays and the like—wherever a warm, pleasing contrast in color tone is desired.

Better yet—See for yourself. Your finishing house will send you a sample panel immediately upon receipt of your request. Or write to us direct, we will see that you receive a finished sample.

The fact that **Brown Bird's-Eye** can easily be produced by your foreman will appeal to you. Just show him a panel, he will know how it is done. Write or wire today for a sample—sent to you absolutely free.

ADDRESS

BIRD'S EYE VENEER COMPANY
ESCANABA, MICHIGAN

"Brown Bird's-Eye Maple"

Veneers and Panels

The Selection of Glues for Joint and Panel Work

Several Grades on the Market With Very Wide Differences—Price is Not a Criterion—Proper Tests Should Govern Glue Purchases

By R. H. Bogue, Ph. D*

Although no set rules can be laid down for the selection of a glue for a given purpose, yet a few general considerations should be borne in mind. Too often a consumer of glue fails to recognize the wide differences that exist in the several grades on the market. What he really wants is the lowest priced glue that will do his work satisfactorily, but his lack of knowledge upon the subject leads him to believe oftentimes that price is the sole factor worth attention, and his work suffers accordingly.

On recognizing his own ignorance upon glue he may put his problems up to the glue salesman and rely upon him to provide him with the proper material. Although most large glue houses employ competent and honest salesmen to handle and distribute their product, yet it must be understood that not all glue salesmen are experts in glue engineering, nor are all salesmen scrupulously conscientious in giving the buyer the best for his money. In short, a consumer who relies entirely upon the salesman is placing himself in a position where he may be sold more expensive glue than he needs; an improper type of glue for the service desired; a poor glue for the price of a good material, or other glue fraudulently described. No injustice is meant to be done the many reputable and competent dealers and salesmen, but not all of these are honest, and not all that are honest are competent. The only safe course for the consumer to follow is to make or have made proper tests upon all material bought, and ascertain that the shipment is as per specifications.

Price Not the Determining Factor

The belief that the price should be the determining factor in glue purchases should be dispelled. A higher priced glue should, as has already been shown, have a much greater covering capacity than a cheaper product, and at the same time produce much stronger joints. These factors must be properly balanced if glue is to be selected efficiently. Under no circumstances should a partially decomposed glue, as revealed by the disagreeable putrid odor, be accepted.

For high class joint work only a good grade of hide glue is used. Although some of the best bone glues may give as good results as an intermediate or low grade of hide glue, it is rarely that large amounts are diverted to such usage. Glues that have been given a ficticious viscosity, as by the addition of alum, should be regarded with suspicion until they have been proved satisfactory. An extraordinarily high viscosity should be compared with the jelly test, and if the former is found to be incommensurate with the latter, a test should be made for ash and alum. An unusually clear glue with high viscosity will often be found to have been clarified with alum. The use of glues with such abnormal viscosities is not ordinarily attended with the best results, for either the glue will be diluted to the consistency at which it is easily applied, and in that case contain actually too small an amount of real glue to make a strong joint, or else it will be applied at the usual percentage of dilution, and in that case be too thick to easily penetrate the pores of the wood, and fail from that reason. If, however, the high viscosity is accompanied by a similarly high jelly strength, such a dilution that will bring the material to a good working condition will not result in a weakened joint.

An abnormally high jelly strength for the viscosity is also undesirable as a rule on account of the rapidity with which such a glue will set. If the glue sets before the joining operation is completed and the pressure applied the joint will be weak. In using such glues it is necessary that the wood be heated to a higher temperature, or that more rapid operation be employed.

The hydrogen ion concentration, or the degree of acidity or alkalinity, should be taken into consideration, as an excessively alkaline glue, pH 9.0 or higher, is usually indicative of overlimed stock which will continue to weaken even after applying to the joint, and an excessively acid glue, pH 3.0 or less, may affect and weaken the fiber of the wood. Between these values, however, there are not likely to be any ill effects noted. The region of pH 4.7 should be avoided, as the viscosity, swelling strength, etc., of the glue are least at this point, but this may easily be corrected by the consumer by the addition of small amounts of acid or alkali. The regions of pH 3.5 or 8.0 are ordinarily most favorable.

If the glue is to be applied by hand the foam need not be considered. If spread by machine, excessive foaming is undesirable. This is ordinarily depressed by the addition of a little fatty matter, but if too large amounts of grease are present a weakening of the joint will result.

Glue for Veneer Work

For veneer work a lower grade of glue may be employed, but a higher viscosity is desirable. This latter is necessary on account of the tendency of a thin liquid to penetrate the pores of the thin sheet of wood and show itself on the opposite surface. The higher viscosity of the liquid used tends to offset this

*Formerly Industrial Fellow of the Mellon Institute of Industrial Research and Research Chemist for Armour & Co., Chicago; now on the staff of Lafayette College.

This article represents a part of the section "Glue as an Adhesive" in the writer's treatise on "The Chemistry and Technology of Gelatin and Glue," published by the McGraw Hill Company of New York.

tendency, and may be secured either by using a higher concentration of the glue, or by employing a glue of a higher viscosity. Since an exceptionally high grade is not necessary, the desired results are very well obtained by using a rather high grade of bone glue and at a somewhat greater concentration. This gives the higher viscosity necessary without increasing the cost. Where penetration does not occur, or when it makes no difference if such does take place, a thinner liquid may be used.

Wide Use for Plywood Panels in Jobbing Shops

Departmental Stores, Hotels, Institutions, Theatres, etc., Employ Vast Quantities for a Large Variety of Purposes—Saves on the Machine Work and Finishing and Decreases Lumber Stocks

By A. W. Williams

One can go into almost any kind of a woodworking plant and find that the owners make use of plywood panels in many ways. They get this material in large sheets, and it is used for drawer bottoms, backs for cupboards, and in innumerable ways. It has in many cases simplified the work of construction in cabinet work, and this applies also to the unlimited assortment of cupboards for commercial and household purposes, of a special nature, that the average town woodworking shop is called on to make.

Take in the case of a cupboard back. Formerly this called for a great deal of work. Rails, called muntins in the trade, had to be tongued and grooved and fitted to the top and bottom of the framing. Panels had to be prepared by resawing or by dressing the lumber down to a thickness, and in many cases by gluing two pieces together before the operation of resawing or planing could be carried out. Then this framed back had to be put in place, which called for a great deal of time to be spent, that is, in comparison with the amount of work involved in putting in a back now.

By the woodworking plant being able to buy large panels in stock sizes, in several different kinds of woods, their work is made very simple where backs and many other parts are concerned. British Columbia fir is undobutedly the most in demand for general purpose work, and if we could see some figures totaling the yearly consumption of this material by woodworking plants we would no doubt get a surprise. It is supplied in several different thicknesses, and many are the uses found for it.

Wide Range of Use for Plywood

The writer was in a woodworking shop recently operated by a large departmental store, and the amount of plywood they consume is amazing. This department is called upon to make all of the fixtures for the company's very large store, and the number and kinds of fixtures to be made are practically endless. The construction of these fixtures, counters, etc., simply resolves itself into a job of making the framing and filling the frames up with panels. Not only are figured wood panels used for the parts of the fixtures that are seen, but thousands of feet of the common class of wood panels are used for inside parts, backs, divisions between drawers to keep material from falling from one drawer into the one underneath it as often happens when drawers are being constantly pulled out and in.

The necessity for these divisions was brought home forcibly to this firm on one occasion when they were about to shift some fixtures from one department to another. They had been used for ladies' waists, and a number of expensive waists had worked their way out of the drawers and dropped down on the floor under the drawers. They were found when the cases were moved, and they were ruined. This decided them on putting the divisions between the drawers. With this form of construction it is difficult for any of the contents of the drawers to work out, and even if they do they cannot get out of the space which the drawer occupies, and they cannot escape observation there as the drawers are removed periodically for inspection.

These divisions increase the use of three ply panels tremendously in this particular shop, and they are only one instance of how new uses are being found continually.

A Boon Where There is Little Equipment

I was in a carpenter shop the other day connected with a large university, and they were quite alive to the possibilities of plywood. They use it extensively, and find it a great boon. In fact I sometimes think it is more of a boon in some of these jobbing shops with a limited amount of machinery than in a really large plant that is fully equipped. Very often the men in these shops would be put to a great deal of trouble to devise a method of construction that could be worked out on the machines at their disposal. For instance, they have no planer. Any work to be planed has either to be sent out to a mill or planed by hand. It will be apparent, therefore, that where they can carry a stock of dressed lumber of a thickness suitable for framing that they have only to rip to a width or cut to length, their work is comparatively easy. It is a simple matter to groove the frames to receive the panels on an ordinary table, and then the panels being obtainable in large squares that will furnish panels of any desired size, makes the work easy.

Another case where I found these panels being made use of recently that was rather interesting was in a theatre. The theatre was being operated by a stock company, and the stage carpenter found the demands for changes of settings quite numerous, and was employing three-ply fir panels to excellent advantage. When I went in to the theatre to see him he was just returning from a nearby planing mill with several fir panels band-sawed to somewhat curious patterns. He was'nt very clear himself as to just what they were for, the designer of the scenery not having explained to him further than furnishing the pattern, but it was evident that plywood was used frequently as a base for scenic effects.

In the department store carpenter shop that I spoke of at the beginning of this article I found them getting out a large quantity of three ply panels recently, that is, they were cutting them to size, and on asking what they were for I was informed that

(Continued on page 88)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

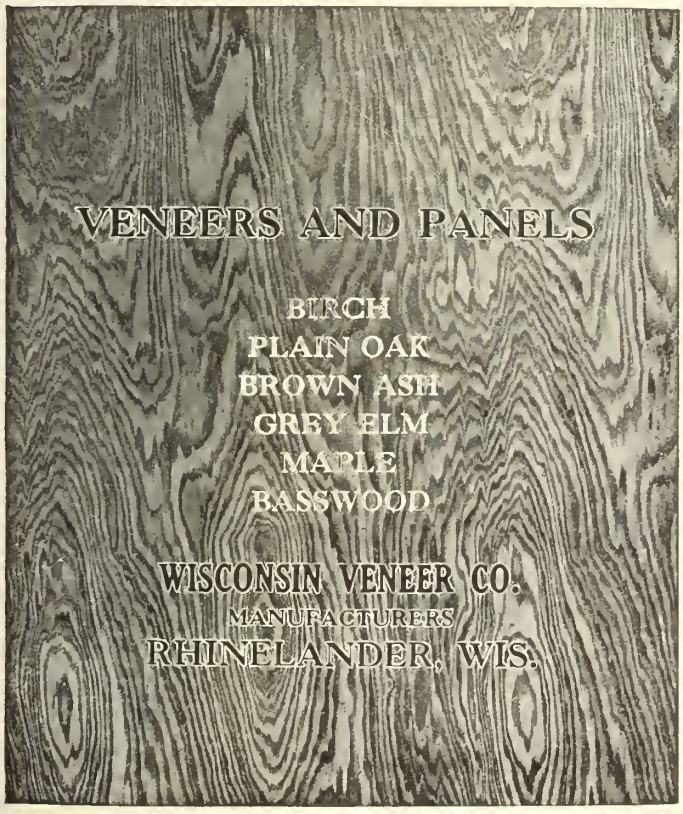
Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.



Litton Veneer Co.

Office and Mill Rockford, Illinois

Manufacturers

American Walnut Veneer and Lumber.

Plain and Figured Veneers of All Kinds.

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, linera and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.

(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.

HOFFMAN BROS. CO.

ESTABLISHED 1867 INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car 1/20'	Red Oak (log run)
½	Car 1/16'	Red Oak (log run)
½	Car 1/20'	White Oak (log run)
½	Car 1/16'	White Oak (log run)
1	Car 1/2S'	Walnut (half round)
25M	1/2S'	Poplar Crossbanding
5	Cars 1/8'	Poplar (log run)
2	**Cars 1/8'**	**Poplar (corestock)**

Prices by wire on receipt of your inquiry

HB

Reg. U.S. Pat. Off.

FORT WAYNE, IND.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

May we know your requirements early?

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Branch Sales Office in charge of George C. Hall, 610 South Michigan Blvd., Chicago, Ill.

Branch Sales Office in charge of W. R. Thompson, 318 Mead Building Rockford, Illinois

Branch Sales Office in charge of C. A. Rugg, 110 West Second St., Jamestown, N.Y.

Branch Sales Office in charge of E. V. Williams, 1219 Harrison Ave., Cincinnati, Ohio.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

"Established 1884"

GUELPH PATENT CASK CO. Ltd.

Scotstown, Que.

QUALITY *SERVICE*

Our Veneers and Plywood are choice and we are fully equipped to supply the Canadian Trade.

Rotary cut Textile dried

We specialize in 1/4" and 3/16" three ply Birch Panels

Ontario Representative:

Frank Moss P. O. Box 356, **Toronto**

Wide Veneer

One carload of 1/20" Quartered White Oak Sawed Veneer 12" and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.

MEMPHIS, TENN.

VENEER MANUFACTURERS COMPANY

Importers **Manufacturers**

ROTARY CUT VENEERS

FIGURED WOODS

PANELS

Ready for Prompt Shipment

Watch the Veneer and Panel Price Stock Lists.

1036 West 37th Street
CHICAGO, U.S.A.

Quality Veneers

in

WALNUT BUTTS
MAHOGANY
LONG WALNUT
BURLS · OAK · POP-
LAR & OTHER WOODS

THE WILLIAMSON VENEER CO.

MILLS - BALTIMORE, MD.

Sales Branches: NEW YORK (709 SIXTH AVENUE) CHICAGO (28 E JACKSON BOULEVARD) HIGH POINT, N.C., JAMESTOWN, N.Y.

VIEWS OF OUR PLANT No. 11.

H.G.W.Del.

Definition—

Superior Veneers—(Ve-neers) which by an unexcelled process, every detail of which receives experienced attention are manufactured by WOOD-MOSAIC COMPANY, Louisville, Ky.

Representative,
GEO. W. STONEMAN CO.
CHICAGO, ILL.

Wide Use for Plywood Panels in Jobbing Shops

(Continued from page 82)

they were to be used for making suit cases. It seems the suit cases are framed up of three ply stock and then covered with imitation leather.

When asked in what particular manner the use of built-up panels had been of benefit to them in their work the superintendent of this shop said their work now consisted largely of getting out stiles, rails and mouldings, and where formerly their draftsmen had been in the habit of drafting up all sorts of complicated forms of construction they were now conversant with the possibilities of ply panels and were careful to make full use of them.

Formerly some of their designs had called for expensive machine work, these involving the use of numerous small panels. Nearly all of these were "raised," or moulded, on the edges on a shaper. At this time their store was not nearly so large, and the demand for fixtures was limited. They had been able to take care of the work then, but if they were obliged to resort to the same methods of construction, now that their work has increased about ten fold, they would be obliged to carry an immense stock of lumber, and they would require a much bigger shop with a great deal more equipment.

The stock of lumber, comparatively small, that they now have to carry is an important item. In a shop such as they run, being down town where property is expensive the firm has to put it to better use than lumber storage. Therefore, with panels to be obtained from stock from several local houses, they are only obliged to carry a very small stock of lumber. They can usually get their requirements promptly in both lumber and panels.

Cheaper to Finish

I think one of the most telling points this gentleman made in enumerating the advantages of panels was that they save considerable money in finishing. By using large panels without moulded edges, or carvings, they are able to do a great deal of their rubbing with an electric rubbing machine. With the old forms of construction this was out of the question.

The advantage advanced for panels in this particular line of work, will, I think, apply in practically every woodworking shop where general jobbing is done, and summed up, these advantages are a great deal less machine work in the construction of cupboards or fixtures of any kind, less lumber to be carried in stock and less machinery. This last feature applies particularly in connection with a carpenter shop operated in conjunction with a large institution of some kind. Formerly they would have found it necessary to install a complete woodworking shop, whereas now they can turn out a great deal of work, in fact practically everything needed, with no machinery other than a jointer, bandsaw and variety saw table, and very often small bench machines operated from electric light sockets will suffice.

Conflicting Opinions About Cauls

Some Firms Use Aluminum Cauls While Others Find that Wooden Ones Have Fewer Faults—One User Has Adopted a Special Design

By Traveller

I always consider that piano factories, generally speaking, have been in the veneering business longer than any other line of woodworking, and their ideas are, as a rule, worth listening to. There are five piano factories in the city where I live and it occurred to me that it might be of interest to make a round of them to discuss the subject of cauls.

The first of the five is still using wooden cauls, and I asked the superintendent if he used wooden ones by choice or whether he had simply continued to use them instead of trying out any other kind. He informed me that he had tried them all and came back to the wood cauls as having the least number of faults. He said he had spent a good deal of money on aluminum cauls, but soon tired of them. The principal reason for this was that they were compelled to cut down the number of pieces of stock in the press owing to the short time the aluminum cauls would retain the heat.

Another difficulty was to keep sufficient grease on the cauls to prevent the veneer sticking to them. If the cauls were used with too little grease and the glue stuck to them the men would invariably try to remove the glue with a chisel; with disastrous results to the cauls.

This gentleman therefore decided to go back to the wood cauls, but in making this decision he decided to use wood cauls that were somewhat different from those used years ago. He took a lumberman with whom he did considerable business into his confidence and advised him that he wanted to get some very wide poplar boards. His idea was to have cauls without joints, and he got them by paying a pretty steep price for the lumber. At the same time these cauls came out a great deal cheaper than aluminum. The widest were about 23 inches. There was a set of these, and another set about 20 inches and some about 16inches. These boards were all specially selected quarter cut poplar and they certainly made a fine outfit of cauls.

Cauls Specially Treated

These cauls were put through a special course of treatment before being put in use. They were heated thoroughly, after being dressed to an even thickness, and beeswax applied to them. This operation was repeated time after time till the cauls were practically saturated with beeswax. Then instead of using zincs between the veneer and cauls as was a popular custom years ago the wood cauls were used by themselves, and the veneer did not stick to them. These cauls retain the heat better than metal. Metal cauls get red hot almost, and then they cool off very quickly whereas the wood cauls do not get burning hot but retain the heat for a lengthy period. The wood cauls are waxed periodically, and one man was made responsible for keeping them in perfect condition.

No trouble has been experienced with veneer or glue sticking to the cauls. One of the arguments in favor of aluminum cauls is that you can put more stock in the press on account of them being so much thinner than the wood. My informant did not at-

C. L. WILLEY COMPANY

The Largest Veneer Plant in the World

YOUR desire for beautiful veneer can be fully and quickly met by the Willey plant. We can serve your special need for veneer, whether ordinary or unusual. Our immense store of desirable material is open for your choice of samples.

Veneer & Lumber

Walnut
American and Circassian
Mahogany
Quartered Oak
English Oak
Satinwood
Vermilion
Teak
Rosewood
And Many Other Foreign and Domestic Woods

(2001)

Nature's Brocades

RICH, silken brocades, woven in the hand looms of the Orient, intrigue the curiosity and haunt the imagination. They are a visible expression of perfect patience wrought into perfect patterns.

Richly brocaded patterns of Veneer, woven in Nature's loom, rival the treasures of the Indies in design and workmanship. Each line is a year, drawn by the slow-moving shuttle of Life through the warp of unhurried time.

Lifelong unremitting toil which somehow in itself makes the toiler's life worth living—that is art. In this sense every phase of a tree's life is a work of art. The beauty of veneer reveals the unwritten history of dumb forests toiling upward through cold and heat, and proves their labor was worth while.

The WILLEY plant exists for the purpose of supplying you with the most beautiful Veneers obtainable in both native and foreign markets. Ask us for samples suited to your special purpose.

C. L. WILLEY COMPANY

2558 South Robey Street
CHICAGO

H. ROBERTSON
Sales Representative for Michigan
232 Lyon St., N.W.
Grand Rapids, Mich.

W. B. VAN
Eastern Sales Representative
Everett Hotel,
Jamestown, N.Y.

tach much weight to this argument and told me to take notice of the press loads in a nearby plant when I visited it. This I did, and I found that they made a practice of building up the bottom of their press with boards, and that on an average twelve pieces constituted a press load. I enquired if this was all they put in a press at one time and was advised that it was; that they could not take a chance on putting any more stock in on account of the cauls cooling off quickly.

Another thing that I took note of was the number of men they used to put in a press. They employed five men on this work, and when I asked if all these men were necessary I was advised that it had been their experience that it was much safer to use five men so they could get the stock under pressure as quickly as possible.

Fewer Men Required

In the first plant they only used four men, and they seemed to accomplish the work just as effiicently. They may have taken a little longer, but I do not think the extra time required amounted to much, and it was easily set off by the fact that they put more stock in a press, their batches usually being about eighteen pieces.

I was not able to see them putting in a press in any of the other plants, but one of these used wooden cauls and the other two aluminum. The wood cauls used by this concern are the ones they have used for years, but it is significant that these people also experimented with aluminum cauls, although they did not go to the expense of putting in a complete outfit, and they retained their wood cauls.

The arguments they advanced against the aluminum cauls were almost identical with those already recorded. The other two plants using the aluminum cauls had not much to say against them, and little to say for them. They seemed to be in the position of having thrown out the wood cauls and bought the others, and were content to go on using them.

The Advantages of Veneer Re-Drying

By the Merritt Engineering and Sales Co.

Wherever there is gluing of wood veneer, there is call for a machine or a process that will flatten veneer and make it thoroughly dry before it passes into the glue press. Lack of precaution in this respect causes certain failure and the attempt to glue veneer in which the contained moisture is an unknown quantity is attended with uncertainty and danger. The loss and damage arising from the use of imperfectly dried veneer is almost incredible and the remedy is so simple and sure that there is not the slightest excuse for it.

Veneer is not always thoroughly dry when it leaves the mill and in fact, it is better that it should be only "shipping dry." Even though thoroughly dry when shipped it is bound to take up enough moisture from the air to cause trouble by the time it reaches the glue room. The truth of the matter is there should be a final re-drying at the plant where the veneer is used and it should precede the gluing but a day or two.

Some kinds of wood are more sensitive than others to the influence of moisture and cause more trouble in the glue room. This is notably true of gum and several instances have come to our attention in which manufacturers of veneered doors have experienced losses running into carloads, simply because the veneer contained too much moisture and had to be redried. The installation of a plate drier instantly puts an end to trouble of this kind.

The flattening of veneer is also a matter of considerable importance. A sheet that is wrinkled or corrugated does not get an even distribution of glue, the pockets and depressions causing a needless glue consumption that is an important factor in the cost of production. It is often remarked in a gluing-up department, that a consignment of wrinkled veneer eats up glue very much faster than an equal quantity of flat and plate machines have been profitably installed from this one cause alone.

Then again, there is a great deal of veneer broken in the glue press which could easily be saved if given proper treatment in a machine that first sweats and then flattens its product. In this class are included sheets that are corrugated on the ends as well as those containing knots, each one of which causes the veneer to buckle for a considerable distance around it. Many a piece of cross-banding has been saved in a plate machine because in no other way can a knot or a cross-grained piece be brought down flat without splitting.

Finally, the owner of a plate machine is not dependent on any one mill for its supply of veneer. He need only require that the veneer be properly cut, knowing full well that the re-drier can be dependent upon to make the final result absolutely certain.

Action of Glue in a Wood Joint

This greatly enlarged section through a glued joint of plywood illustrates a fact, not generally understood, that the glue uniting two wood surfaces does not lie in a smooth sheet but enters the cell cavities through the open ends on the cut surface and clinches the joint by means of millions of tiny barbs and anchors. The arrow indicates the point

How glue penetrates into wood pores

at which the glue entered the pore to the left of the glue line. The glue-filled pores near the glue line on the right all open on the cut surface at some point and were filled in the same manner, as little or no penetration takes place through the cell walls. Viscosity and pressure must be adjusted to suit the character and number of cells and pores in different kinds of woods to obtain the strongest joint. The photograph was furnished by the U. S. Forest Service.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

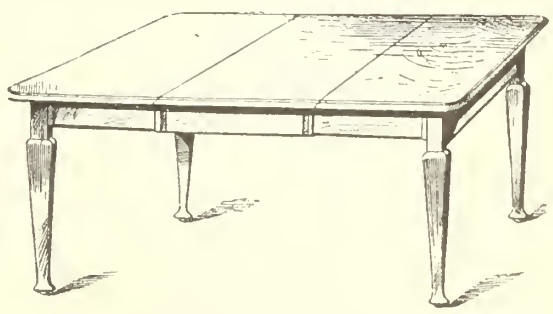
VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

GOOD Plywood is only produced by using first class materials; properly constructed, by careful and skilled workmen.

Our panels are made in this way. Panels in Maple, Birch, Plain Oak, Qrt. Oak, Walnut, Mahogany, Gum, etc., in standard sizes or made to order in quantities.

Flush Veneered Doors in B.C. Fir, Georgia Pine, Plain Oak, Qrt. Oak, etc.



Write for catalogue and prices.

HAY & CO., Limited Woodstock, Ont.

How Upholstery Leathers are Manufactured

(Continued from page 72)

and if allowed to stand would rot. It is therefore, placed in the tan yard in vats of weak tan liquor. Being near the lumber districts, the Eagle-Ottawa Leather Company can use the hemlock bark tannage which gives a much softer leather than the commercial extract. The liquor is obtainable by pouring steam over great leaches of ground bark and running the resultant liquor through pipes to the storage vats below. The liquors are gradually strengthened and the tannins enter the corium fibres of the hides changing them to an insoluble and imputrescible product. This is the pivotable step in which the character of the goods undergoes permanent change. This step also demonstrates why genuine leather can outlast its imitations. No matter how cleverly applied, the finish of these latter may be, the even penetration of the tannins with chemical and physical actions makes the genuine article something that will wear for years. "As tough as leather" is an axiom.

However, leather cannot alone be tough; it must be soft and pliable as well. After tanning, the hides must be split as the natural thickness would prevent their being of any commercial use except for sole and harness leather. The belt knife splitting machine is one of the most wonderful pieces of modern machinery ever invented. The hides are fitted in between rollers and split by a rotating knife to a required thickness. The top, or grain leather, is the softest and best, so from it are made all our deluxe morocco and dualtone leather. Next comes our Wolverine special machine buffed, which is used for less expensive upholstery. Then the second split, which is used for diners and pad seats in the furniture trade. Next comes the slab or collar split used for horse-collars or a thin grain or buff may be removed from the hide for pocket-books or camera cases. The next cut is the machine buffed followed by the first and second splits. All grains are then retanned and fat-liquored to give softness and pliability. They are then tacked to dry.

Finishing

The leather is now said to be "in the russet" and is carefully sorted before being sent to the finishers. The hides are first given several coats of finish, forming a strong non-crackable pliable film over the surface. This is followed by two coats of paint of the desired shade and luster. These coats are dried in the ovens and then the leather receives a light smoke over-coat. It is crushed by hand to bring out the natural grain and then rubbed carefully with solvent, which removes the upper coat on the folds exposing the under-coat, and leaving the upper coat in the creases. Thus the beautiful dualtone effect is obtained. Hides are then measured and shipped.

The finish on the finest kind of leather that goes on furniture can be ruined by the use of varnishes or furniture polishes, most of which contain solvents that will penetrate the finish of the leather and cause it to become soft and sticky. When you buy leather furniture from your manufacturer. It would be well to insist on a guarantee that the surface coat has a linseed oil finish. What is known as a straight "dope" leather has an offensive order to begin with and will become sticky in a comparatively short time, especially during hot weather.

We suggest the following formula for cleaning upholstery leather: use nothing but castile soap and water. Apply a damp (not wet) cloth to the soap and rub the surface of the leather briskly; next apply a moist cloth without soap; finish by rubbing dry with a clean soft cloth.

How To Reduce Costs

Writing in the Bulletin of the Taylor Society, Wallace Clark outlines a practical plan for reducing losses during a depression. In a period of declining or dull business, there are in every manufacturing plant certain expenditures which must go on, no matter how few orders there are. A skeleton organization must be kept in the shop—the superintendent, foreman, inspectors, truckmen, watchmen and so on. In addition, there are the interest on the investment on land, buildings and equipment, depreciation, taxes, insurance and repairs. All these expenses go on whether there is work or not; they are due to keeping ready for work and are not increased by the acceptance of an order. It is clear, therefore, that these overhead expenses or losses will not be increased by the acceptance of an order at a price which does not cover any of this overhead. The expenses created by the acceptance of a specific order are cost of material, direct labor, power and fuel. It may be stated then that prices can be reduced without increasing losses to a point which covers the cost of material, direct labor, power and fuel, but which does not cover any part of the overhead.

Knowing that he has nothing to lose until he reaches the material-labor-power-fuel cost, the manager begins to lower his quotations and keeps on until he gets the orders. When there is plenty of work ahead, prices should be quoted which will produce profits, but when there is little work to be had, prices should be quoted which will reduce losses.

BOX NAILS and WIRE for Every Use

We manufacture a complete line of nails and wire in every style and size. Your special needs can be supplied. Write us today. We manufacture special styles to order.

Laidlaw Bale-Tie Co., Ltd.

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

ONTARIO HANDLE CO.
411 Manning Chambers
TORONTO
Manufacturers of
BROOM and BRUSH HANDLES
DOWELS and BRUSH BACKS
and SMALL TURNINGS

SOUTHERN & CANADIAN HARDWOODS

OAK WALNUT POPLAR CHESTNUT GUM

We can offer you a most excellent service in Southern Hardwoods for we are getting cars for loading at Louisville. Mixed cars of any number of items supplied without extra cost. Large stocks of lumber always carried at Toronto ensuring prompt delivery. Get our prices. They are attractive and the grading liberal.

Special at Louisville

2 cars 6/4 x 10" and wider Red Oak.
2 cars 6/4 x 10" and wider White Oak.

TORONTO HARDWOOD LUMBER COMPANY LIMITED

Head Office:
1100-1104 Queen St. W., TORONTO. Phone Park, 6980
Yard: Atlantic & Hanna Aves. Grand Trunk Ry. Toronto. Saw-mill: Louisville, Ky.

Case Goods, Flush Veneer Doors, 3 and 5 Ply Panels, Tops, 3 and 4 Ply Table Rims, 5 Ply Rim Bound Table Tops

FOR IMMEDIATE SHIPMENT

Stock Panels in Mahogany, Walnut, Oak, Birch, etc.

—SIZES—

24 x 60, 24 x 72, 30 x 60, 30 x 72

Quality and Service are unexcelled. Write for prices.

PANELS LIMITED

—SOUTHAMPTON, ONT.—

Selling Agents—TORONTO VENEER CO., LTD.
1100-1104 QUEEN STREET WEST, TORONTO, ONT.

The Lumber Market

Domestic Woods

The general demand for hardwoods continues on a more satisfactory scale than for some time past. The number of inquiries is steadily increasing and an improvement for the lower ends is noticeable. Woodworking industries are generally quite active, particularly furniture factories, piano firms and phonograph companies. This, of course, is largely attributable to a rush of orders for Christmas specialties. Whether the present activity will continue after the holidays is another question. In the meantime, business in these plants is on a better basis than it has been for some time. Agricultural implement and vehicle firms are also quite busy and a number of them are taking on extra men.

It looks as if those who are anticipating their wants and replenishing their depleted stocks of hardwoods at the present time are showing good judgment and wise foresight. There is bound to be a scarcity of certain grades and thicknesses of dry hardwood during the spring, which will mean a corresponding increase in price. Some firms, who are farsighted, are buying enough to cover their requirements until early next summer.

One deterrent factor at present is the securing of adequate supplies and the distribution of the product. The car shortage at divers points is very acute and there are embargoes at many terminals. Everywhere one goes there is heard a strong arraignment of transportation facilities, and were it not for the congestion and the impossibility of making shipments or getting in supplies, the hardwood situation would be a comparative paradise today to what it has been.

Leading dealers report that there is a good call for hardwoods for the manufacture of interior trim and there is moderate buying on the part of other miscellaneous consumers. Prices on the whole continue firm with an upward tendency. As the season advances the requisitions for hardwood lumber continue to grow more pronounced and the inquiries are broadening out in character. A larger percentage of the latter is also developing into orders. One of the leading officials of a big hardwood producing firm stated recently that business was fully up to normal and the volume of orders was increasing each week. The main trouble was the car situation. There will be a larger stock of birch, elm, maple and ash taken out during the coming winter than there has for some time past.

Birch is steady with a slant toward higher prices in the lower grades. Basswood and ash are fairly firm, especially in thin stock. There is a livelier market for the lower grades in 6/4 and 8/4 in ash than there is in the firsts and seconds. Maple is decidedly active, particularly in 8/4 and 10/4, but it is not easy to secure these thicknesses. 4/4 maple is rather dull at the present time.

Manufacturers, wholesalers and consumers of hardwood are looking forward to a steady trade during the coming year. Confidence is reasserting itself and the great desideratum is stabilization of values. It may be said that, on the whole, the hardwood market has come to its own more during the past few weeks than during the whole of the first six months of 1922. This has, no doubt, been caused by the gradual revival of industrial operations, the gradual consumption of stocks in hand and the firm yet upward trend of values. Spreads in prices are not nearly as wide as they were a few weeks ago, which is a healthy indication of the strengthening influence and growing proportions of the market.

Imported Woods

Through the United States the hardwood market is reported to be in excellent condition, advices from all the chief centres indicating that business is brisk and that orders are plentiful. This cheering news is evident even in markets that a few weeks ago were dull. It appears that the effect of the railroad car shortage is still being felt, on which account deliveries are not as good as they should be. However, the mills are expending every effort in trying to keep up with the volume of orders that are being received. Generally speaking, prices are firm with an upward trend, if anything. Indications, judging by the number of orders, are that the woodworking industry will be pretty busy this winter and right through into next season. Furniture factories in general report prosperity while the millwork operators are not much less enthusiastic although there will tend to be a falling off in this class of work as the building season slackens during the winter. Specific reports from some of the more important centres follow.

Memphis, Tenn.—It is reported that the demand for hardwood lumber and forest products is more active than for a great many months, with all kinds and grades being asked for. Manufacturers of hardwood flooring and furniture are in the market in a large way, the former planning to operate full time for quite a while yet, although there may be a little slackness later on as building decreases. The furniture manufacturers find themselves very busy and are in the market for considerable quantities of lumber. The car shortage is still holding up delivery and buyers seem quite willing to pay premiums to ensure prompt shipment. Prices are firm with an upward tendency.

Evansville, Ind.—Exceptionally good market conditions are reported in the Evansville district, the demand for certain grades of lumber having increased. The outlook for business is considered very good although the car shortage is still troublesome and in the opinion of lumbermen not likely to improve for some time. The furniture manufacturers are in the market for considerable lumber and indeed these plants have been operating overtime in order to catch up with the orders that were placed at the last Evansville furniture market. The belief is expressed that 1923 will be a better trade year than the present one for all furniture manufacturers.

Louisville, Ky.—An active demand for all lines of forest products is reported. All woods seem to be moving well and prices are either holding firm or advancing slightly. The hardwood flooring trade is buying freely and the same is true of the interior trim market. The furniture men, too, seem to be buying quite freely. As in other centres, the car shortage is a troublesome feature.

The salesman who takes pains to satisy the small customer lays the foundation for selling the big customer next day.

The Sidman Lumber Curing Process

IN

Remodeled or new, Wood, Brick or **Concrete** Buildings.

Fillers and glazes to preserve the building.

The TAG-ROESCH **Automatic** Time-Temperature and **Humidity Controller.**

Three-ply and Du-o-fold Army Duck Curtains, and Hussey Door Carrier Doors.

Automatic Heating, Ventilating and Humidity Systems for Varnish Rooms.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Sidmans AUTOMATIC **Suction System** for returning ALL Condensation DIRECT to the Boiler.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-Down Draught Vent Heads for all purposes.

Cleanable Screen Panel and Window Ventilators.

Roller Bearing (Ott) **Channel Iron** Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and The Sidman Special Hygrometers.

For Description and prices, write

The

Sidmans of Canada

Heating and Ventilating Engineers and Lumber Curing Specialists

LONDON ONTARIO

THE G.V.S. L.C.K. Reg Trade Mark

"Take your pick You can't go wrong on any of them

3	Cars	4/4"	No. 1 Com. & Btr. Birch.			
1	"	5/4"	"	"	"	"
1	"	8/4"	"	"	"	"
½	"	10/4"	"	"	"	"
½	"	12/4"	"	"	"	"
2	"	5/4"	No. 2 C. & Btr. Basswood			
1	"	6/4"	"	"	"	"
1	"	12/4"	No. 1 C.&B. Hard Maple.			
2	"	8/4"	No. 2 C.&B. Soft Maple.			

Your inquiries will be welcome and have good care."

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 514 Canada Cement Co., Bldg.

Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

News of the Trade

Scott Lumber Co. Ltd., Port Arthur, Ont., is a new concern incorporated with a provincial charter to manufacture all kinds of wood products. Capital $50,000.

European Furnishing Fabrics, Ltd., Toronto, have been granted a federal charter to act as agents in Canada for European commercial houses. Capital $250,000.

Wm. Rutherford & Sons Co. Ltd., Montreal, have secured the millwork contract for 24 residences on Oxford Avenue, Montreal, to cost $200,000.

Harris Box & Card Co. Ltd., Sherbrooke, Que., was recently granted a federal charter to manufacture boxes and cartons. Capital $90,000.

Elgin Davenport Co. Ltd., Toronto, is a new organization incorporated with a capital of $40,000, to manufacture and market all kinds of furniture.

B. F. Sturtevant Co. of Canada Limited, makers of dry kilns and fan systems have increased their capital from $50,000 to $200,000.

Tweedale Co. Ltd., Montreal, is a new organization with federal charter to manufacture and market trucks, aeroplanes, automobiles and other vehicles.

Adjustable Dress Form Co., 14 Millstone Lane, Toronto, suffered a loss by fire of about $30,000. The firm manufactured wooden dress forms, coat hangers and other such articles.

Acme Sash & Door Co. Ltd., St. Boniface, Man., were recently granted the millwork contract for the new office building for dentists and physicians, at Winnipeg, to cost $100,000.

J. A. Straith, president and general manager of the Standard Paint & Varnish Co., Windsor, Ont., is convalescing after being badly bruised and shaken up in an automobile accident recently.

Merritt Bros.' basket factory log-yard, Grimsby, Ont., was the scene of a fatal accident recently when A. Grant, an employee, was crushed to death by large logs rolling from a pile nine feet high. Deceased was 35 years of age.

W. H. Glide, a well known carriage maker, recently opened a business in this line at Sunderland, Ont. Mr. Glide has been in the business of carriage making for the past 50 years.

A. L. Little, late of Jones Hardwood Co., Boston, Mass., has joined the staff of Edward Clark & Sons, Toronto, and will look after their shipping interests in Quebec and the East.

The ratepayers of Huntsville, Ont., recently endorsed a by-law granting the Muskoka Wood Mfg. Co., a ten year fixed assessment on their new flooring plant. It will be remembered that the entire plant of the company was burned to the ground last summer.

The Duncan Lumber Co. Ltd., Vancouver, B. C., has opened an office at 222 Craig St. W., Montreal. The company is represented by J. F. Forman, formerly with the Canada Car & Foundry Co. Mr. Forman also represents the Hugh MacLean Lumber Co., of Buffalo.

The firm of Hollowell & Schofield, toy manufacturers of North Bayout, have recently dissolved partnership. A. A. Johnston, having purchased the interest of T. Schofield, the firm is now known as Hollowell & Johnston, sash and door manufacturers.

Car building prospects in Canada look extremely favorable as the Canadian railways are in need of more rolling stock. The consolidation of the Government lines in the Canadian National System is considered a preliminary to the introduction of more rolling stock in the interests of more efficiency and larger carrying capacity.

W. J. Crockford & Co., has recently opened a factory at Orillia, Ont., known as the Orillia Clothes Pin Co., manufacturing 4 inch round clothes pins. The factory is very thoroughly equipped with all the necessary machinery for manufacturing this product on a large scale and business is very good at the present time.

Edmund Hind, manager of the Edmund Hind Lumber Co. Ltd., who passed away recently in Toronto, enjoyed the esteem of a large circle of friends. A comparatively young man of 47 years, he nevertheless had a wide experience in the lumber business. For some time he was with lumber firms in North Tonawanda, N. Y., and later was manager for Smith, Fassett & Co., at Charlton, Ont.

A provincial charter has been granted the Georgetown Lumber Company, with an authorized capital stock of $100,000, and headquarters in Georgetown, Ont. The incorporators of the company are Messrs. Morris Saxe, W. H. Kenter and Albert D Tost. The company is authorized to conduct a general lumber and woodworking business.

Chas. Johnson, who has been manager of the Rochester Yard of Mowbray & Robinson Lumber Co., of Cincinnati, and is well known in Canada, has purchased the Rochester yard. He will carry on under the name of Charles Johnson. Mr. Johnson is a brother of J. R. Johnson, wholesale lumber dealer at Toronto.

O. Pritchard, of Orillia, Ont., well known to the woodworking trade, being in this business for many years, has opened a factory known as the Toy & Woodenware Factory of Orillia, the products including clothes hangers, childrens' sleighs, rocking horses, clothes horses and store display fixtures. Business is reported very good at present.

Fire completely destroyed the planing mill of the James T. Gilchrist Lumber Co., Gladstone Ave., Torronto, recently, causing a loss of $10,000. Some of the machinery equipment was destroyed by the flames, but the greater part of it escaped. The firm is making preparations to rebuild, but are as yet undecided upon the class of construction.

Edward Clark, head of the firm Edward Clark & Sons, Toronto, specialists in Birch, died recently in his 75th year at St. Catharines, Ont. The late Mr Clark was born in Hull, Eng., and came to this country with his parents at the age of six. Farming was his first occupation, but later he established a sawmill in connection with his farm. From then on he was interested in the lumber industry and 25 years ago he established the wholesale business in Hamilton, Ont., which bears his name. Later he moved his headquarters to Toronto.

A charter has recently been granted B. W. Lockhart, Limited, Moncton, N. B., which firm has taken over the plant operated for a number of years by the Paul Lea Co. The B. W. Lockhart, Limited, will specialize in sash and doors and are dealers in spruce, pine and B. C. fir lumber. The firm also operates a planing mill and turns out hardwood flooring.

Operating lumber and limit holders from various parts of Ontario recently waited upon Premier Drury in regard to the retention of the Doyle Rule as the scale measurement in the industry. The premier said that while he did not see eye to eye with all arguments presented on the measurement question, he approached the problem with an open mind. He assured the deputation, however, that the computation basis on existing contracts would not be changed except by mutual consent.

Peter Armstrong, Hamilton, Ont., who for many years

Uniform Lumber Means Greatest Satisfaction To The User!

You no doubt have experienced the expense, loss of time, and loss of materials, caused by the use of improperly cured, wrongly graded, and carelessly handled hardwood.

Kraetzer-Cured Lumber is absolutely uniform in quality, properly graded, and every board plainly marked, showing the grade. To show our faith in Kraetzer-Cured products, every board is stamped with our brand.

THE KRAETZER-CURED LUMBER CO.

Because of our unusual facilities we control the lumber from the virgin growth to the time it is loaded on the cars and shipped to you.

When you have once used Kraetzer-Cured Lumber you will not be satisfied with the ordinary kind. Read the eight important reasons why Kraetzer-Cured Gum is used by thousands with such satisfactory results. It will give the same results to you.

Kraetzer-Cured Lumber is of the very best quality, carefully handled by all departments. Every step in this process is taken with the idea of producing uniform high grade hardwood that w ill give maximum service in your hands.

In addition to Kraetzer-Cured Gum, we can furnish Oak, Ash and other Southern Hardwoods.

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorehead, Miss. Leflore, Miss.

You Should Use KRAETZER-CURED GUMWOOD *Because:-*

1. It is STRAIGHT and FLAT, free from the warp and twist usually encountered in untreated stock.
2. It is BRIGHT and will satisfactorily take any finish.
3. It is free from dote or rot—the sap and gums are eliminated by the steaming process, and fermentation and decomposition are thus prevented.
4. Through the elimination of stain and decomposition, it possesses greater strength and longer life.
5. It contains only atmospheric moisture, enabling it to be used for many purposes without kiln drying.
6. When kiln drying is necessary, this can be done in much less time and with more satisfactory results.
7. It is uniform and dependable. One car like another, grade and measurement what it should be—no time w a s t e d in reporting complaints or shortages, no delays or interference with factory schedules because of holding lumber for adjustments.
8. It is the most economical lumber available. It will satisfactorily answer any requirements expected of materially higher priced woods. Join our little army of satisfied users, and just as peace is about to supplant war, let peace of mind take the place of the warfare and worries that usually beset the user of lumber.

We're proud of this product —that's why.

conducted a carriage factory on Mary St., recently passed away.

Grace Invalid Bed Chair Co. Ltd., Toronto, is a recent incorporation.

London Shipping Containers, Ltd., London, Ont., are preparing plans for a new factory at a cost of $50,000.

Brown & Rutherford, Winnipeg, Man., recently secured the millwork contract for a new skating rink at Winnipeg, to cost $75,000.

The Atlas broom plant has been moved from Springfield to St. Thomas, Ont. Adequate housing accommodation for the employees was lacking in the former town.

Muskoka Wood Mfg. Co., Huntsville, Ont., have started excavation for the building of a dry kiln. The building will be one storey 151 x 60 feet.

Carriage Factories, Limited, Montreal, for the year ended July 31, 1922, showed a deficit on the financial statement of $467,467.

Leduc & Fils, Limited, Beauharnois, P. Q., is a new organization incorporated with a provincial charter ao manufacture and market sashes, doors and other wood products. Capital $49,000.

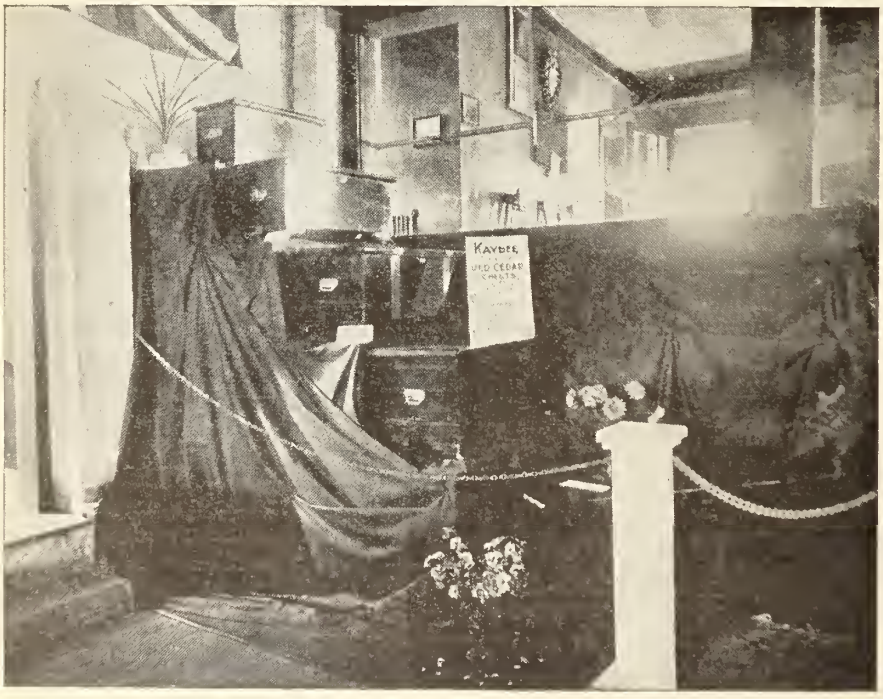
Jean Baptiste Tasse, well known carriage manufacturer of Ottawa, passed away recently in his 79th year. During his career, deceased was employed by Joseph Duford, F. H. Plant, Limited, and the Ottawa Car Manufacturing Co.

Ernest T Lewis, Vancouver, widely known organ building expert on the coast, disappeared after being treated in the General Hospital for nerve trouble. The disappearance was solved recently when the man's body was washed up on the beach in that city.

J. H. McDonald and R. L. Cliff, both of the B. C. Manufacturing Co., box makers, New Westminster, B. C., recently sailed for Australia with a view to enquiring at first hand into the market for boxes and shooks. New Zealand is shipping white pine into Australia in return for hardwood under the new reciprocity agreement between the two colonies.

Keenan Bros., Owen Sound, Ont., sawmillers and woodworkers, recently purchased the property and equipment of Rixon-Ainsley-Stoddart Co. Ltd., Owen Sound. The Keenan people intend scrapping the mill equipment and using the property for storage purposes. The Keenan holdings have now large frontages on the east side of the bay where the Eureka Refrigerator Co., and the Keenan Woodenware plants are located.

The training of apprentices for planing mills and woodworking plants was a subject that was discussed with interest at the recent annual convention of the National Retail Lumber Dealers' Associatiin, held at Cleveland, Ohio. Frank S. Dickey, of the Pittsburgh Lumbermen's Club, spoke on the subject and said that partly due to trade unions and partly due to parents encouraging their sons to follow "white collar" jobs, the trade was slowly being starved. In Pittsburgh and Chicago the problem is being combatted by establishing training schools under proper conditions to encourage an appreciation of the industry.



A pyramid of red cedar chests shown by the Keenan Woodenware Co., of Owen Sound, at a recent Made-in-Owen Sound Exhibit. The display aroused much interest.

Perkins Glue Company Expands

General good conditions prevailing in the wood using industries have reflected in such increased business for the Perkins Glue Company that it has again increased the manufacturing capacity at its plant in Lansdale, Pa. Announcement comes from the sales office in South Bend, Indiana, that the sales of its well known brand of vegetable glue for 1922 are exceeding the sales of any other year in the history of the company.

A mill with plenty of room to move the stuff from machine to machine saves a great deal of useless labor.

QUALITY SERVICE

Things are moving again

Industry is speeding up. Better get in the procession and have the goods to meet the demand.

You will need

something in Canadian Hardwoods.

Try ours

With your factory facilities and our lumber, it will be a hard combination to resist.

Kinnon Lumber Co.
LIMITED
454 King St. W. Toronto

New and Used Woodworking Machinery

We can save you money—look over our partial list and if you do not see your requirements —Write, wire or phone us.

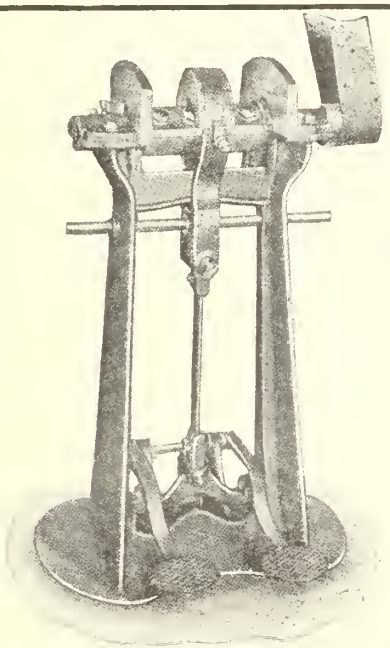
	SHAVING EXHAUSTERS	
50"	American Blower Co., 16" Outlet	$ 75.00
40"	Keith 15" Outlet	50.00
	MOULDERS	
7"	4 Sided Goldie McCullough	350.00
7"	3 Sided Cowan & Co.	275.00
12"	4 Sided Cowan & Co.	650.00
	SHAPERS	
2	Spindle	110.00
1	Spindle	85.00
	SANDERS	
	Pattern Maker's Disc & Drum 18"	75.00
131	Mattison Belt Sander 8' Table	350.00
	PLANERS	
24"	Major Harper Poney Planer	175.00
30" x 12"	McGregor Gourlay Double Surfacer	1250.00
24"	Buzz Planer No Fence	100.00
12"	Buzz Planer Complete	100.00
	MORTISERS	
	Cant Brothers Galt	75.00
	Cowan Co	75.00
	LATHES	
12"	Pattern Maker's Iron Bed.	75.00
	SAWS	
	Trim and Rip Saw	125.00
42"	Jackson Cochrane Band Rip	250.00
	Elliott Woodworker 1-½ Wagner Motor	180.00

GENERAL MACHINERY CO.
67-69 Frederick St., TORONTO
TELEPHONE MAIN 2200W

The Peter Hay Knife Co., Ltd.

Manufacture the Best
PLANER KNIVES
and CUTTERS
OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited
GALT, ONTARIO



Irregular Dresser or Shaper

This machine is designed for dressing all odd or irregular stock to shape.

Especially suitable for box pattern work. Necessary in every mill where body stock is turned out.

WOODWORKING MACHINES

No. 19 Small Saw Tenoner. No. 20 Large Saw Tenoner.
No. 21 Regular Bevel and Mitre Saw. No. 22 Large Bevel and Mitre Saw.
No. 23 8½-in. Irregular Dresser No. 24 6-in. Irregular Dresser Stock clamps.

Woodworking machines equipped with direct motor or belt drive

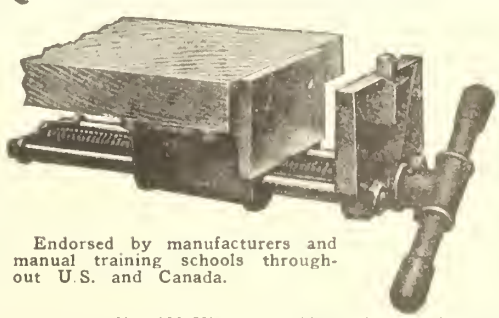
METAL MACHINES

Large Automatic Power Hammers (For body panels and all other metal work.)
Small Automatic Power Hammers (For body panels and all other metal work.)
Metal Trimming Cutters.
Rotary Cutters.
Metal Rollers or Formers.
Power Beaders. Foot Presses.

Write for catalogue.

PETTINGELL MACHINE COMPANY
AMESBURY - MASS.

Quick as a Cat - A Hold like a Bull Dog



Endorsed by manufacturers and manual training schools throughout U.S. and Canada.

No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

No. 430 Vise—Two Sizes with or without stop
UNEQUALLED FOR STRENGTH AND DURABILITY
Our Complete Catalogue on Request
RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

Position Wanted

EFFICIENCY ENGINEER—administration, production and cost specialist. At present on re-organization large sash, door and general woodworking concern in Eastern Canada. Will be open for an executive engagement on or about 1st January, 1923.

This is your opportunity to secure the services of a high class man at a moderate salary. Willing to go anywhere, preferably Ontario. Highest references. Box 147, Canadian Woodworker, Toronto. 11

For Sale

Rip-Saw, hand feed, Cast Iron Table 36″ x 55½″ with Counter shaft, built by T. Ballantyne & Co. Ltd., Preston, Ont. Also—a Two Spindle Shaper, Spindles 1⅛″ diam. and 18″ on centre, Wood Table 36″ x 48″, Cast Iron Frame and Countershaft; made by Cant Gourlay & Co., Galt, Ont.

Both machines are in first class condition and will give many years of good service. Low prices for Quick Sale.

OTTERVILLE MFG. CO. LTD.,
11 Otterville, Ont.

GOOD VALUES

Subject to Prior Sale

Band Resaw, Connell & Dengler, 54 and 60 inch.
Band Rip Saw, Yates No. 281.
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 30″ and 44″.
Dowel Machine, Clement.
Dowel Gluer and Driver, E. B. Hayes.
Jointer, Falls Machine Co. under cut 24″.
Jointers, 12″, 16″, 24″.
Jointer, Diehl, Continuous Feed.
Lathe, Back Knife, Clement 40″.
Matcher, American No. 229 hardwood.
Matcher, Berlin No. 94, 15″ x 6″.
Moulder, Woods 10 and 12″ inside.
Moulder, American 7″ and 10″ 4 side.
Planers, all sizes, single and double.
Sander, endless bed, 48″ H. B. Smith.
Sander, Moore Machine Co. belt.
Sanders, Berlin 36″, 42″, 48″ and 60″.
Sander, Clement Belt roller table.
Saws, Berlin Double Cross Cut.
1—15 x 4—Four side McGregor Gourlay Matcher.

Woodworking Machinery Co., of Buffalo,
54 Mechanic St.,
Buffalo, N. Y.
10 T.f.

For Sale

Linderman Jointer with cut off saw. Shop Number 265 but this does not represent type of machine as has been rebuilt; is up-to-date and first class, has all attachments. Takes stock up to 72″. Also Fay and Egan Band Rip-saw No. 202, First class condition. Diameter wheel 42″, width of wheel 4″. Tight and loose pulleys, self feeding attachment. Equipment includes swedge, side dresser, power band saw grinder, and brazing clamp. Both these machines can be bought right. Address Box 145, Canadian Woodworker, Toronto. 10-11

Machinery for Sale

1–16″	Buzz Planer (C.M.G.).
1	Chain Mortizer (New Britton).
	Circulator Saw Grinder (Hart Cor.).
3	Head, Hayes sticker 6″.
1–30″	Planer knife grinder (Hart Cor.).
1–20″	Drill.
1	Blind Slat Machine (M.C.G.).
1	Door Clamp.
1–36″	Band Saw (Ballantyne).
1	Rivetting Machine High Speed Hammer Co.
1	Chain Feed Box Board Matcher (C.M.G.).
1	Sash relisher & Mortiser (C.M.G.)
1 Ft.	Mitering Machine.
1	McGregor Gourlay Tenoning Machine.
1	Knight Jig Saw.
1–75	Horse Power Wheelock Engine.
1	Power Mortiser (McGregor & Gourlay).
1	Swing Saw (Goldie & McCullough).
1	Blind Wiring Machine (McGregor).
1	Planer & Matcher (Clarke & Deening).
1 No.	118 Inside Moulder (Berlin).
1	Veneer Press 6 section of 3 screws each (Francis).
1–4	Head sticker 6″ (Greenlie).
1	Saw table (Jackson & Cochrane & Co.).

MACHINERY EQUIPMENT & SUPPLY CO. REG'D.,
40 Queen St.,
10-12 E.o.1. Montreal.

Hardwood Institute Starts Engineering Work

The services of Frederick F. Murray have been secured to administer the engineering needs of the Hardwood Manufacturers Institute's program.

Mr. Murray is a graduate of Stevens Institute of Technology, Hoboken, N. J., where he was awarded the coveted degree of Mechanical Engineer.

Mr. Murray is a member of the American Society of Mechanical Engineers and has been active in the affairs of its Forest Products Division.

After a period of employment by the Government in the Ordinance Department, and later in Government construction work.

It is believed that Mr. Murray's training, and particularly the study that he has already made of the lumber industry from an engineering standpoint, admirably fits him for the position with which he is now entrusted.

Concerning the work immediately before the Institute the comprehensive program outlined by Mr. Murray comprises the following:—

A—Complete listing and analysis of hardwood species under consideration, with normal annual production in feet by gades, also general sizes in so far as possible and normal basis sale value by species, grades and general sizes, to provide a working outline of the existing elements of hardwood production.

B—Complete engineer's investigation of industries consuming that production, to involve:

(1) The measure of importance of these industries, and the relative importance of each industry.

(2) Analysis of each industry tracing thoroughly so as to prepare a list of specific articles or classes of articles manufactured by which might be called an individual industry.

(3) A comparison of factory methods in manufacturing these specific articles or classes of articles in the individual industry at its principal manufacturing centers, by both its large and small institutions, in order to determine the variable factors present—wood species used, grades used, sizes and any other variables in specifications looking always for the relation between raw stock and finished product.

(4) As a result of this analysis to determine within as exact limits as possible, the best sawmill and factory practice to attain the best realization—this will involve co-operative study between the manufacturer of hardwoods and the consuming industries and a thorough application of the economics of the hardwood as a whole.

(5) Experimentation and research to establish new utilities for hardwoods, particularly for wayward species overcoming ill-founded prejudice and strengthening utility of grades and species not enjoying full measure of use.

Just how this work will be carried out is a matter now being outlined. Mr. Murray says the operation will largely be determined by a study of reliable data already available and the selection of a program which will contribute most largely to both speed and accuracy. As this work progresses Mr. Murray believes its findings will be both illuminating and convincing to the extreme and that accomplishment of the work will be most gratifying expedited by the thorough co-operation of all hardwood consuming industries.

Business Paper Fundamentals Taught by Daily Newspapers

GLANCE through the pages of any great Daily Newspaper and notice how it tends toward Business Paper practice.

Here is a building section, there an electrical department, again columns of interest to wholesaler, a lumber page, a theatrical page, a sporting page—and next to each you find the advertising relative to the subject in question.

Watch the reader turn to the department in which he is most interested—where the advertising is to be found which will be most likely to appeal to him. So with the business man—as a time-saver, he takes up his business paper to learn the latest developments in his special field. Other publications have but a casual interest for him—because they broaden his general knowledge or afford mental relaxation—but it's the business publication he desires, and requires, when he's thinking of business only. He knows that the business paper will give him the very facts he needs—briefly and **reliably**—in both editorial and advertising pages.

To advertise in business publications places your products before such business men at a time when they're thinking of business.

Lowest Rate Per Interested Reader

Hugh C. MacLean Publications

Electrical News
Canada Lumberman
Footwear in Canada
Canadian Woodworker
Western Contractor and Builder
Contract Record & Engineering Review
Commercial & Retail Merchants' Review
Furniture World
Western Lumberman
Western Coal Review

Head Office : 345 West Adelaide Street

Vancouver Chicago Toronto Montreal Winnipeg

The largest publishers of technical papers in the British Empire, printing in Toronto, Winnipeg and Vancouver. Proprietors of MacLean Building Reports Limited.

The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co. Toledo, Ohio.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARING
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Garlock Machinery Ltd., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Co., Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B. Hamilton Ont.

BAND SAWS
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Yates Machine Co., P. B. Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P. B. Hamilton, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKnight & Sons Co., L. G., Gardner, Mass.
Williams Machinery Co., A. R. Toronto, Ont.

BEVEL & MITRE SAWS
Pettingell Machine Co. Amesbury, Mass.

BIRCH
Edward Clark & Sons, Toronto, Ont.

BLOWERS
Canadian Blower & Forge Co. Kitchener, Ont.
Sturtevant B. F. & Co., Galt, Ont.

BLOW PIPING
Canadian Blower & Forge Co. Kitchener, Ont.

BORING MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Sons Co., L. G., Gardner, Mass.
Nash, J. M. Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. R. Hamilton, Ont.
Valley City Machine Works, Grand Rapids, Mich.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Morgan Machine Co., Rochester, N.Y.
Merritt Eng & Sales Co., Lockport, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CARVINGS
Klise Mfg. Co., Grand Rapids, Mich.
Decorators Supply Co., Chicago.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

CARVED WOOD MOULDINGS
Klise Mfg. Co., Grand Rapids, Mich.

CASTERS
Foster, Merriam Co., Merriden, Conn.
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Sons Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C. Indianapolis, Ind.
Shurly-Dietrich, Galt, Ont.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Sons Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company,
Taylor Mfg. Co., Jas. L. Poughkeepsie, N.Y.

CLAMP CARRIERS
Bell Machine Co., Oshkosh, Wis.
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
Merritt Eng. & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

CRATING LUMBER
Colborn, C. B. Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D. Guelph, Ont.

CUT OFF SAWS
Atkins & Co., E. C. Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Co., of Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rochford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Shimer Cutter Head Co., Galt, Ont.,
Yates Machine Co., P. B., Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOORS
Pannill Door Co. Ltd., Toronto, Ont.

DOORS (Flush Veneered)
Hay & Co. Ltd., Woodstock, Ont.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.
Richard-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Wylie & Co., Matthew Glasgow, Scotland

DOWEL MACHINES
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company,
Ober Mfg. Co., Chagrin Falls, Ohio.
Preston Woodworking Machinery Co., Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
W. S. Hawker Mfg. Co., Dayton, Ohio.

DOWELS
Canada Wood Specialty Co. Ltd., Orillia, Ont.
Rowe Mfg. Co., Newago, Mich.

DRIERS (Hot Plate)
Merritt Eng. & Sales Co., Lockport, N. Y.

DRIERS (Veneer)
Merrit Eng. & Sales Co., Lockport, N. Y.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont.
Cutler Desk Co., Buffalo, N. Y.
Grand Rapids Veneer Works, Grand Rapids, Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

DYNAMOS
Industrial Engineering Co., Toronto, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

EDGER SAWS
Atkins & Co., E. C. Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

ENAMELS
Cosmos Chemical Co., Port Hope, Ont.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Garlock Machinery Ltd., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co., Kitchener, Ont.
Sturtevant, B. F. & Co., Galt, Ont.

FEED ROLLS
Atkins & Co., E. C. Hamilton, Ont.

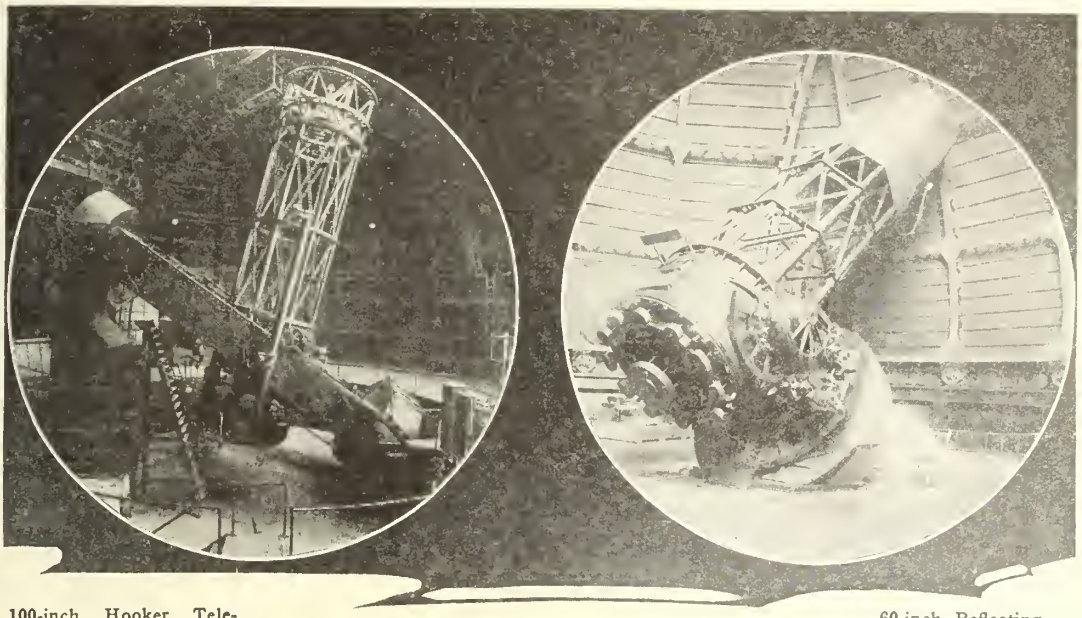
FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FIBRE PRODUCTS
Carter, E. T. Toronto, Ont.
National Patent Reed Sales Co., Philadelphia, Pa.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

FRUIT PACKAGE MACHINERY
St. Joseph Iron Works, St. Joseph, Mich.

SKF



100-inch Hooker Telescope with Cassegrain spectrograph.

60-inch Reflecting Telescope from the West

The World's Largest Telescope
—*Weight 650 Tons*—Ball Bearing Equipped

Only 50 H.P.—divided between 40 small motors—is required to operate the great 100-inch telescope of the Mount Wilson Observatory—the largest in the world.

The massive 550-ton dome, mounted on 28 ball-bearing equipped trucks, responds to the traction of two small 7½ H.P. motors. Altogether, over 200 **SKF** marked ball-bearings support the dome and the telescope's 100 tons of moving parts.

The companion of this powerful instrument, a 60-inch telescope—likewise at Mount Wilson—is also equipped with **SKF** marked ball bearings.

The fact that ball bearings are very accurate, practically frictionless and show no appreciable wear, contributes much towards maintaining the delicate movement and ease of adjustment so essential where millions of miles are measured by a mere fraction of an inch.

What ball bearings accomplish under these extraordinary conditions is a good indication of their value in the commoner machines of industry and science.

CANADIAN **SKF** COMPANY, LIMITED
Toronto · Montreal

Races displaced to show DEEP-GROOVE bearing carrying maximum end thrust in a forward direction.

Races displaced to show THE SAME bearing carrying maximum thrust in reverse direction.

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N. Y.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.
Dominion Appraisal Co., Toronto, Ont.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.

GLUE
Canada Glue Co., Brantford, Ont.
Cannon Canadian Co., Toronto, Ont.
Coignet Chemical Products Co., New York, N.Y.
Kane Manufacturing Co., Chicago, Ill.
Monite Waterproof Glue Co., Minneapolis, Minn.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Taylor Mfg. Co., Jas. L. Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.

GLUE ROOM EQUIPMENT
Merritt Eng. & Sales Co., Lockport, N.Y.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R. Toronto, Ont.

Grinders (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng. & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.

GROOVERS
Atkins & Co., E. C. Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Mattison Machine Works, Rochford, Ill.

GUM LUMBER
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W. Va.

HAIR (Curled)

Blocksom & Co., Michigan City, Ind.

HAND SCREWS

Fay & Egan Co., J. A. Cincinnati. Ohio.

HANDLE & SPOKE MACHINERY

Bell Machine Co., Oshkosh, Wis.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works. Rochford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE

Laidlaw Bale-Tie Co., Hamilton, Ont.
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.

HARDWOOD DIMENSION STOCK

Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER

Anderson, Shreiner & Mawson, Toronto, Ont.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr-Holaday Lumber Co., Greenfield, Ohio.
Bruce Co., E. L. Little Rock, Ark.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Clark, Edward & Sons, Toronto, Ont.
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Dudley Lumber Co. Inc., Memphis, Tenn.
Farrin Lumber Co., M. B., Cincinnati, Ohio
Gulf Lumber & Trading Co., New Orleans, La.
Hafner Manufacturing Co., St. Louis, Mo.
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co., Toronto, Ont.
Kinnon Lumber Co. Ltd., Toronto, Ont.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
Maus, Lumber Co., Chas. O. South Bend, Ind.
May Hardwood Co., R. R. Louisville, Ky.
Memphis Band Mill Co., Memphis, Tenn.
Merceau-Hawkins Tie Co., Huntington, W. Va.
Mowbray & Robinson, Cincinnati, Ohio.
Otis Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Walnut Co., St. Louis, Mo.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Sullivan, Frank T. Buffalo, N. Y.
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES

Merritt Eng. & Sales Co., Lockport, N.Y.

JOINTERS

Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)

Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

Knobs
Waddell Mfg Co., Grand Rapids, Mich.

LACQUERS
Cosmos Chemical Co., Port Hope, Ont.
Celluloid Zapon Co., New York, N. Y.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Garlock Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sanducky, Ohio.
Mattison Machine Works, Rochford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont.

LEGS
Klise Manufacturing Co., Grand Rapids, Mich.

MACHINE KNIVES
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

MITRE SAWS
Atkins & Co., E. C. Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Garlock Machinery Ltd., Toronto, Ont.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.

MOTORS
Industrial Engineering Co., Toronto, Ont.

MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati. Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

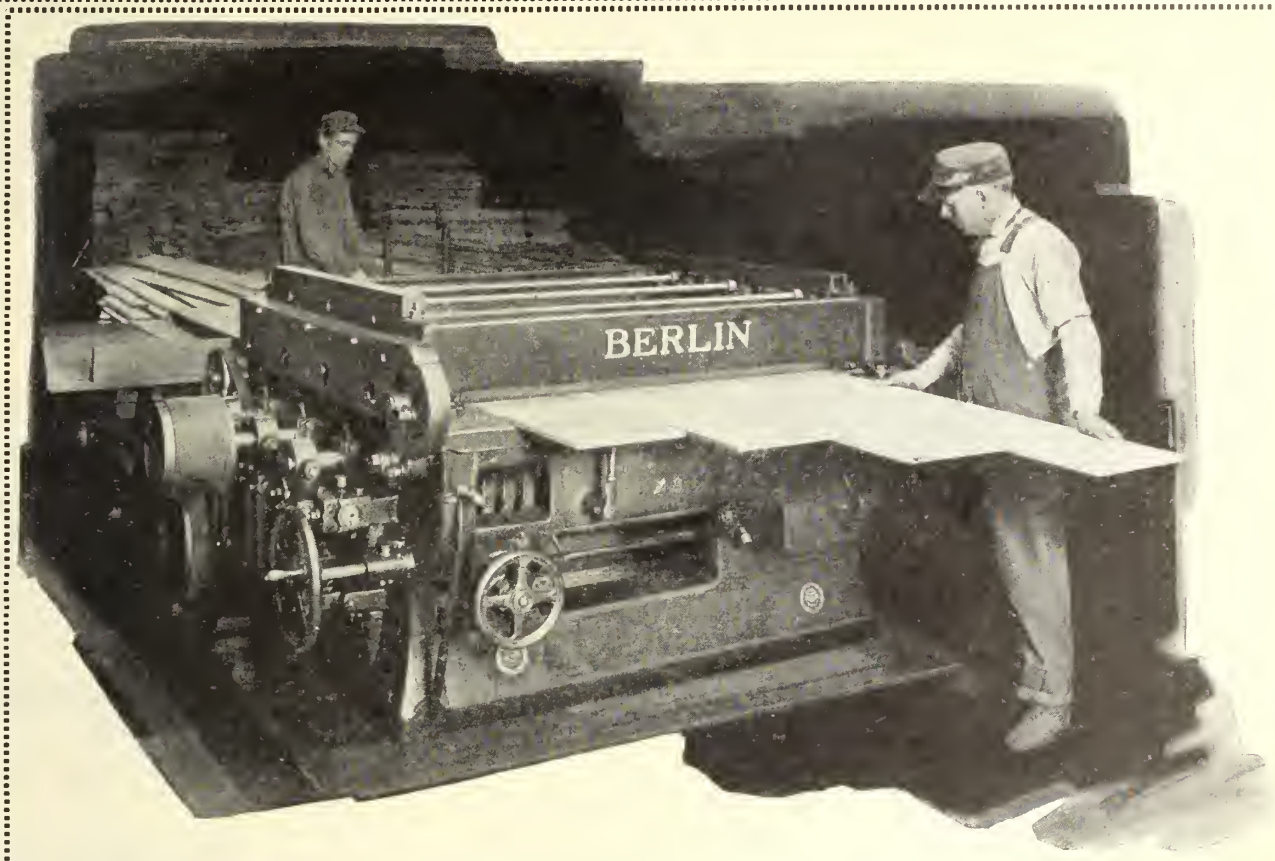
NAILING MACHINES
Morgan Machine Co., Rochester, N. Y.
Wylie & Co., Matthew Glasgow, Scotland
Yates Machine Co., P. B., Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PAINT
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Calhoun Plywood Co., Sheboyan, Wis.
Hardwood Products Co., Necnah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rochford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R. Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont



What Makes A Garnet Paper Successful?

THE successful performance of any garnet paper is read in the increased production it gives; is noted in the superior finish it produces; it is written in the records of lowered sanding costs.

In hundreds of plants Carborundum Brand Garnet Paper is giving just such sanding results, enabling the sanders to keep production up where it should be—giving a smooth, uniform, scratchless finish—standing up to the work without dulling or filling—and thus keeping down sanding costs.

You would expect such results from a garnet paper that is made right—that has a strong, durable, flexible backing of the best rope stock—that is coated with the highest grade of glue and the hardest, sharpest of all garnet, the North River Garnet.

The Carborundum Company, Niagara Falls, N. Y., U. S. A.
New York, Boston, Chicago, Cleveland, Detroit, Cincinnati, Philadelphia, Pittsburgh, Grand Rapids, Milwaukee

CARBORUNDUM BRAND GARNET PRODUCTS

Make Good Sanders—Better Sanders

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
American Plywood Corporation, New London, Wis.
Bury, Robt. & Co. (Can.) Ltd., Toronto, Ont.
Calhoun Plywood Co., Sheboygan, Wis.
Guelph Patent Cask Co., Scotstown, P. Q.
Hay & Co. Ltd., Woodstock, Ont.
Wisconsin Veneer Co., Rhinelander, Wis.

PERIOD MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter, E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FOLLOE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
McKenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Wylie & Co., Matthew Glasgow, Scotland
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co., Herman, Brooklyn, N. Y.

SASH, DOOR & BLIND MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SATINWOOD
Willey Co., C. L., Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P. Q.

SAW FILING MACHINERY
American Saw Filing Machine Co., Boston, Mass.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKenzie Machinery Co., D., Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW TENONERS
Pettingell Machine Co., Amesbury, Mass.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHELLAC
Kasebier-Chatfield Shellac Co.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Bruce Woodworkers Ltd., Chesley, Ont.
Walter & Company, B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis.

TEMPERATURE REGULATORS
Canadian Powers Regulators Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N. Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.
Hay & Co. Ltd., Woodstock, Ont.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

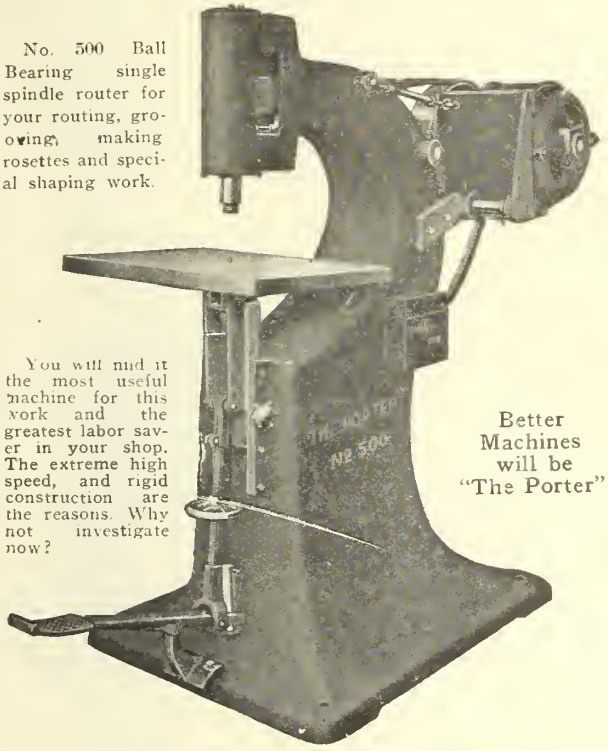
TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont
Klise Manufacturing Co., Grand Rapids, Mich
Walter & Sons, J. Kitchener, Ont.

TWIST WORK
Klise Manufacturing Co., Grand Rapids, Mich

UPHOLSTERY
Oriental Textiles Co., Oshawa, Ont.

Use the "PORTER"

No. 500 Ball Bearing single spindle router for your routing, grooving, making rosettes and special shaping work.

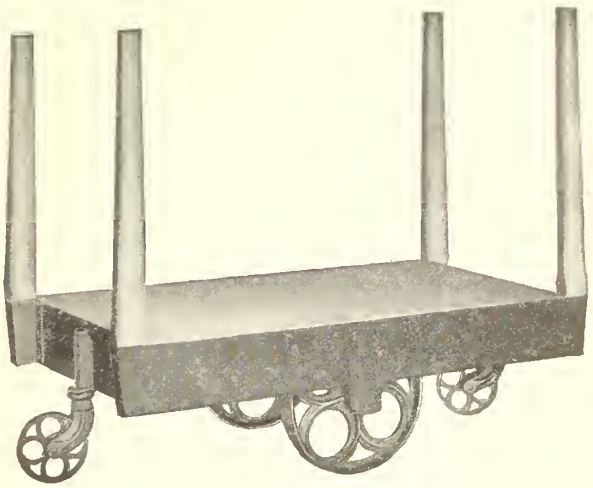


You will find it the most useful machine for this work and the greatest labor saver in your shop. The extreme high speed, and rigid construction are the reasons. Why not investigate now?

Better Machines will be "The Porter"

C. O. Porter Machinery Co.
666 Front Ave. W. GRAND RAPIDS, MICH.

NOW IS THE TIME



To Cut Your Production Cost by Using
"GLOBE"
ALL STEEL FACTORY TRUCKS
Made in 3 sizes :
24" x 52" 28" x 58" 34" x 70"

Globe Vise & Truck Co.
GRAND RAPIDS, MICH.

The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5.000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

Dominion Appraisal Company Limited

The Test of An Appraisal

"We have never been so grateful for anything we have done as for the appraisal made by you in December 1919. It certainly was worth thousands of dollars to us in the adjustment of the fire."

Port Arthur Daily News Limited
May 5th, 1921

Our staff of qualified appraisers—men with many years experience in the appraisal field—and our system of careful supervision of all work entrusted to our care has afforded protection to our large clientel extending throughout the Dominion of Canada.

We solicit your correspondence

8-10 Wellington Street East
TORONTO, ONT.
Telephone Main 646.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISH DRYERS
Nicholls Co., A. S., New York, N. Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Company, Robert, Toronto, Ont.
Guelph Patent Cask Co., Scotstown, P. Q.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mohawk Veneer Co., Warren, Pa.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland, Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N. Y., High Point, N. C.
Wisconsin Veneer Co., Rhinelander, Wis.
Willey Co., C. L., Chicago, Ill.
Wood Mosaic Co., Louisville, Ky.

VENEER CLIPPERS
St. Joseph Iron Works. St. Joseph, Mich.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N. Y.
Preston Woodworking Machinery Company, Preston, Ont.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N. Y.
St. Joseph Iron Works, St. Joseph, Mich.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Des Moines Sawmill Co., Des Moines, Iowa.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Walnut Company, St. Louis.
Sullivan, Frank T., Buffalo, N. Y.

WASTE
Carter, E. T., Toronto, Ont.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw-Bale-Tie Co., Hamilton, Ont.

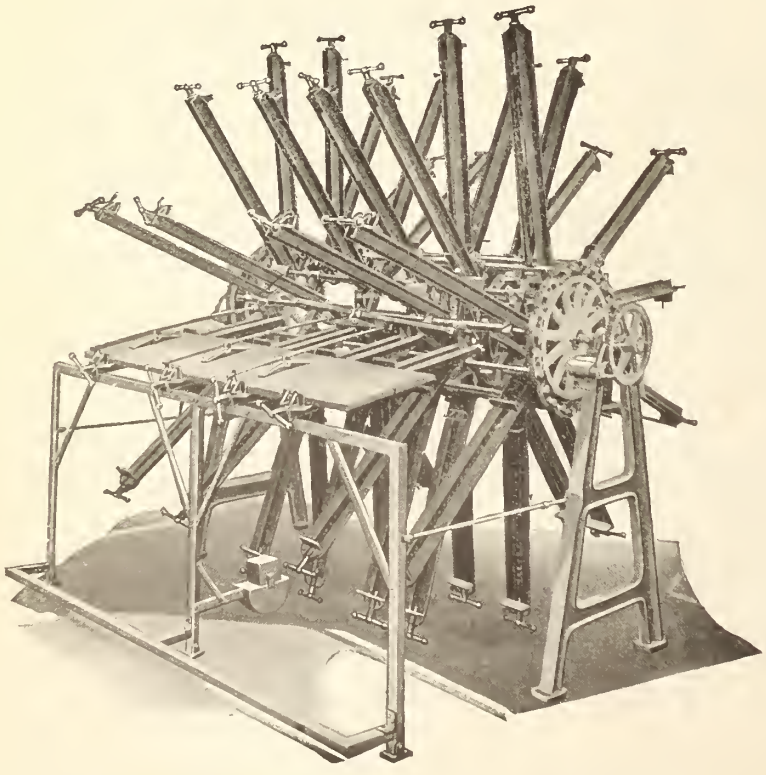
WOODWORKING MACHINERY
Bell Machine Co., Oshkosh, Wis.
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Pettingell Machine Co., Amesbury, Mass.

WOOD TURNING MACHINERY
Bell Machine Co., Oshkosh, Wis.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK

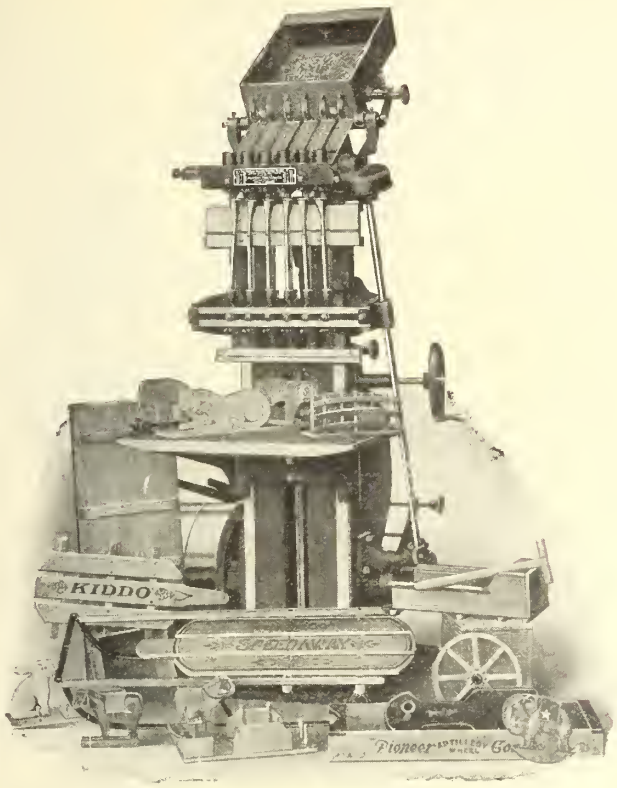
CLAMP CARRIER
for
Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.



Morgan No. 6 Nailing Machine

MORGAN
NAILING MACHINES

Used in Nailing Wooden Toys

Many manufacturers of American Wooden Toys use our machines for driving 5/8" to 1 1/8" nails. Machines are adjustable in operation and can be adapted to any kind of nailing work.

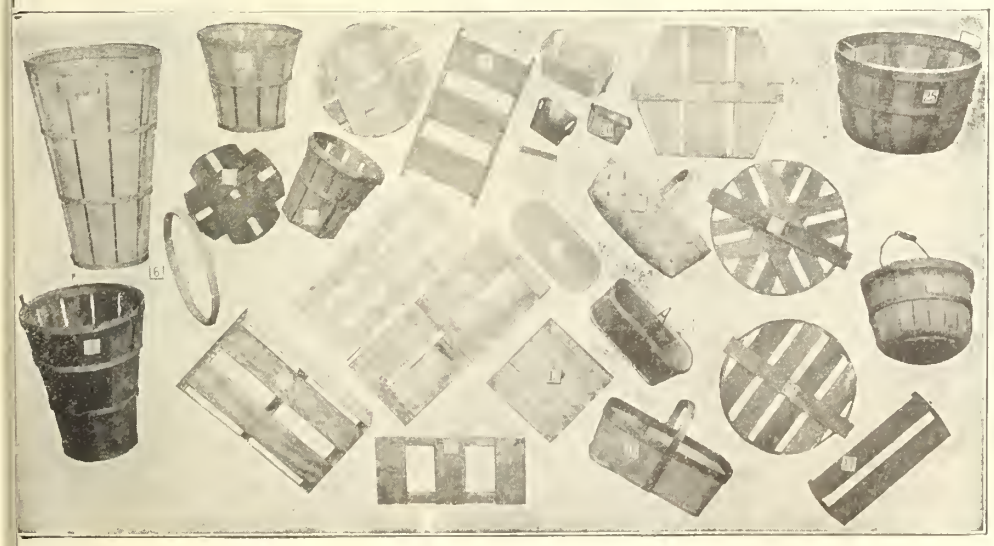
If you are driving nails by hand, in making boxes, crates, toys, any woodenware articles, figure the cost. It is expensive.

Then send us samples of your work. Get an estimate of the cost of nailing on a Morgan Nailing Machine. Compare the figures. We'll leave the rest to your judgment.

Send us your nailing problems. We shall be pleased to give them our careful consideration and advise you regarding equipment for handling them. We invite your inquiry.

Morgan Machine Company
Rochester, N. Y.

THIS IS THE NAME



of the Machinery for the Rapid Production of

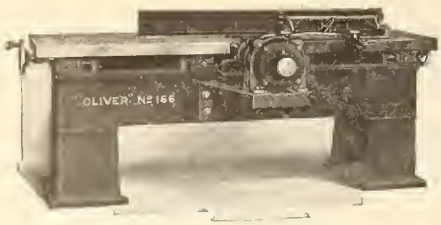
Veneer—Crates—Baskets—Fruit Packages.

"St. Joe"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

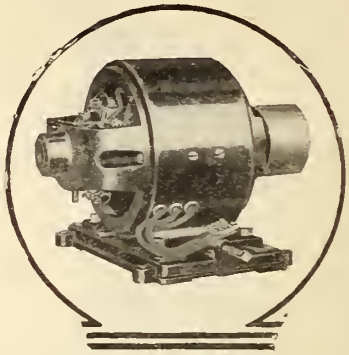
"Oliver Quality"



WOODWORKING MACHINERY

"Oliver" Jointers are built in all sizes from the 4-inch portable type, for attaching to lamp socket, to the very heaviest jointers built.

Oliver Machinery Co.
Grand Rapids
Michigan,
U.S.A.



Bargains in Motors

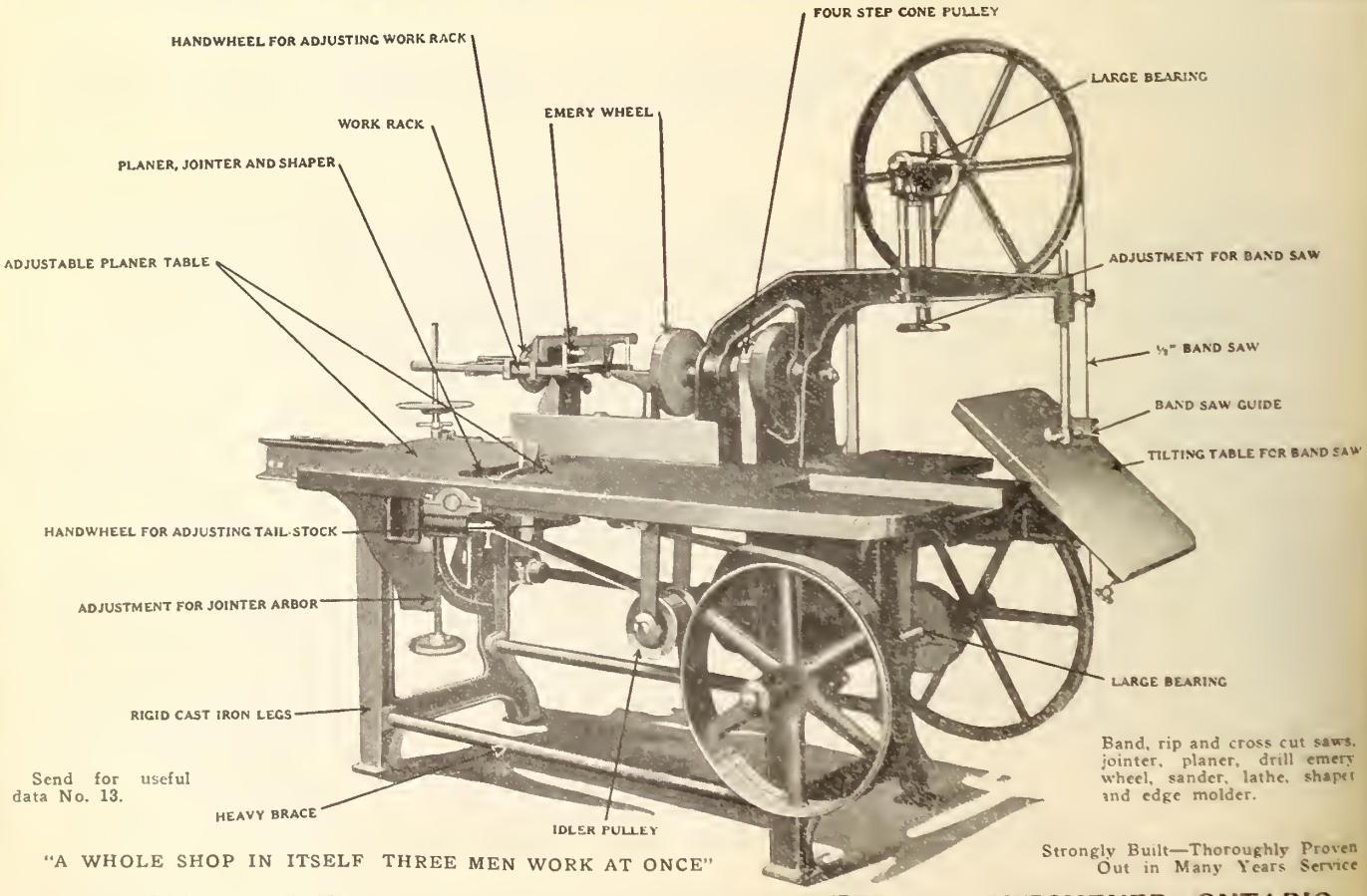
We have a large stock of new and used motors ready for immediate shipment and fully guaranteed. Write us for prices.

Industrial Engineering Company of Canada Ltd.

CONSULTING ENGINEERS - ELECTRICAL EQUIPMENT

R. G. LEE, General Manager

Carlaw Building, Toronto - Royal Bank Building Windsor, Ont.



Send for useful data No. 13.

Band, rip and cross cut saws, jointer, planer, drill emery wheel, sander, lathe, shaper and edge molder.

"A WHOLE SHOP IN ITSELF THREE MEN WORK AT ONCE"

Strongly Built—Thoroughly Proven Out in Many Years Service

CANADIAN BLOWER AND FORGE COMPANY, LIMITED KITCHENER, ONTARIO

SIMONDS

Novelty SAWS

High-grade Steel and perfect mechanical construction make Simonds Novelty Saws leaders everywhere. They cut smooth and hold their tension and cutting-edge longer.

We also make Concave, Groover and Special Circular Saws as well as Big Circular and Band Saws, Planer Knives and Files.

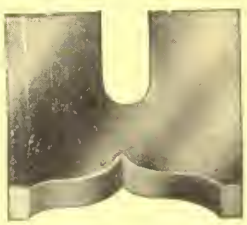
Write for Prices

Simonds Canada Saw Co., Limited

"The Saw Makers"

Montreal, Que. - St. John, N. B. - Vancouver, B. C.

ATKINS



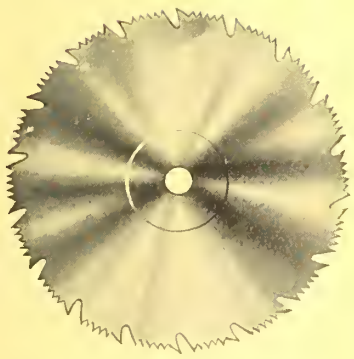
STERLING QUALITY

SAWS and KNIVES ECONOMIZE

ARE your saws and knives wasting your lumber? If so, why not turn that waste into a profit by installing

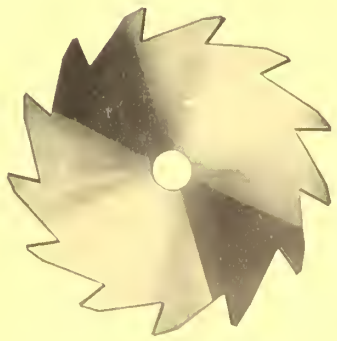
Atkins Sterling Quality Saws

and Machine Knives



Some of the largest woodworking mills in the country are using Atkins Saws exclusively, because they increase production, stop waste and make a name for themselves wherever they go.

Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.

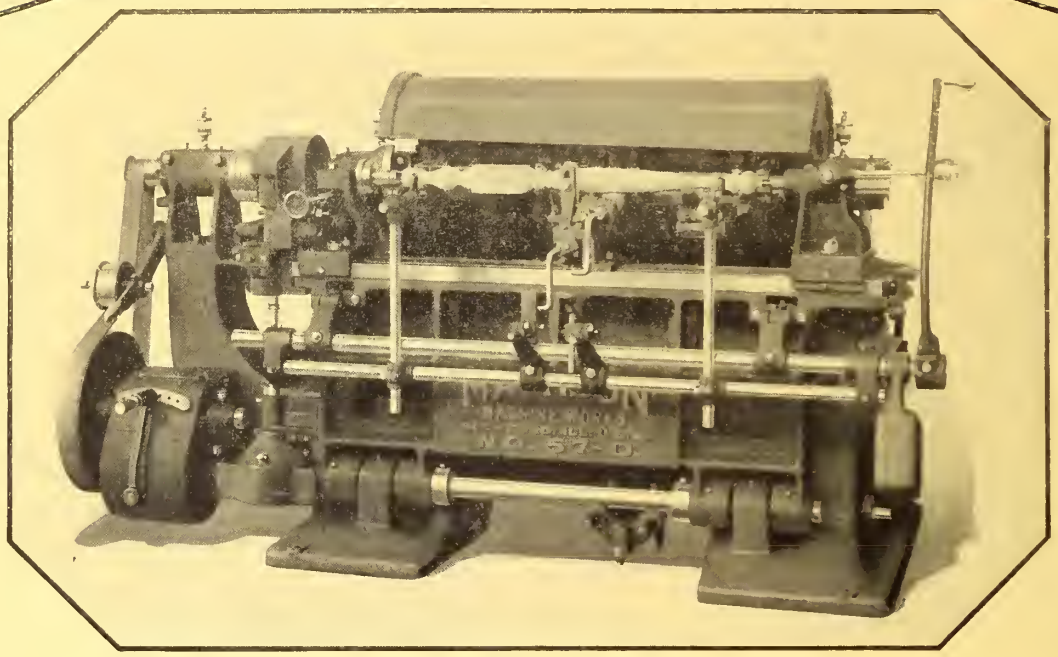


E.C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

MATTISON



The Result of Continuous Development

The newly designed Model D Mattison Automatic Shaping Lathe satisfies every requirement of modern production in turned work. It is heavier where added weight is an advantage. Its operation is faster and more convenient. Workholding devices have been simplified to facilitate changes and adjustments. Head stock gears are permanently adjusted at factory and are never disturbed, thus eliminating undue wear. Main bearings are larger with an improved lubricating system. These are only a few of the important refinements which our twenty-five years' experience in building the Standard Machine Turner have proven worth while.

Even though you now have an old style turning machine in operation it will pay you to investigate the production possibilities of this New Model.

Ask for Bulletin Describing the New Features in Detail.

MATTISON MACHINE WORKS

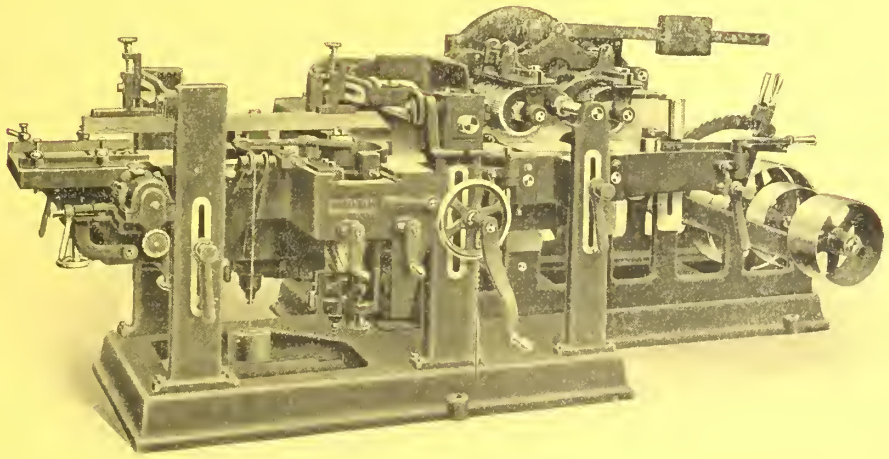
ROCKFORD, ILLINOIS, U.S.A.

MACHINERY

olume-Twenty-Two TORONTO, December, 1922 Number Twelve

CANADIAN WOODWORKER and Furniture Manufacturer

MOULDER 289



To Work 12″ or 10″ Wide; Four Side; Table Lowers 8″

Few Gears, all large diameter, all covered
All Chipbreakers and Fences adjustable to and from all Cutter Heads
Outend Top Head Bearing adjustable and self aligning

Woodworking Machinery that Satisfies

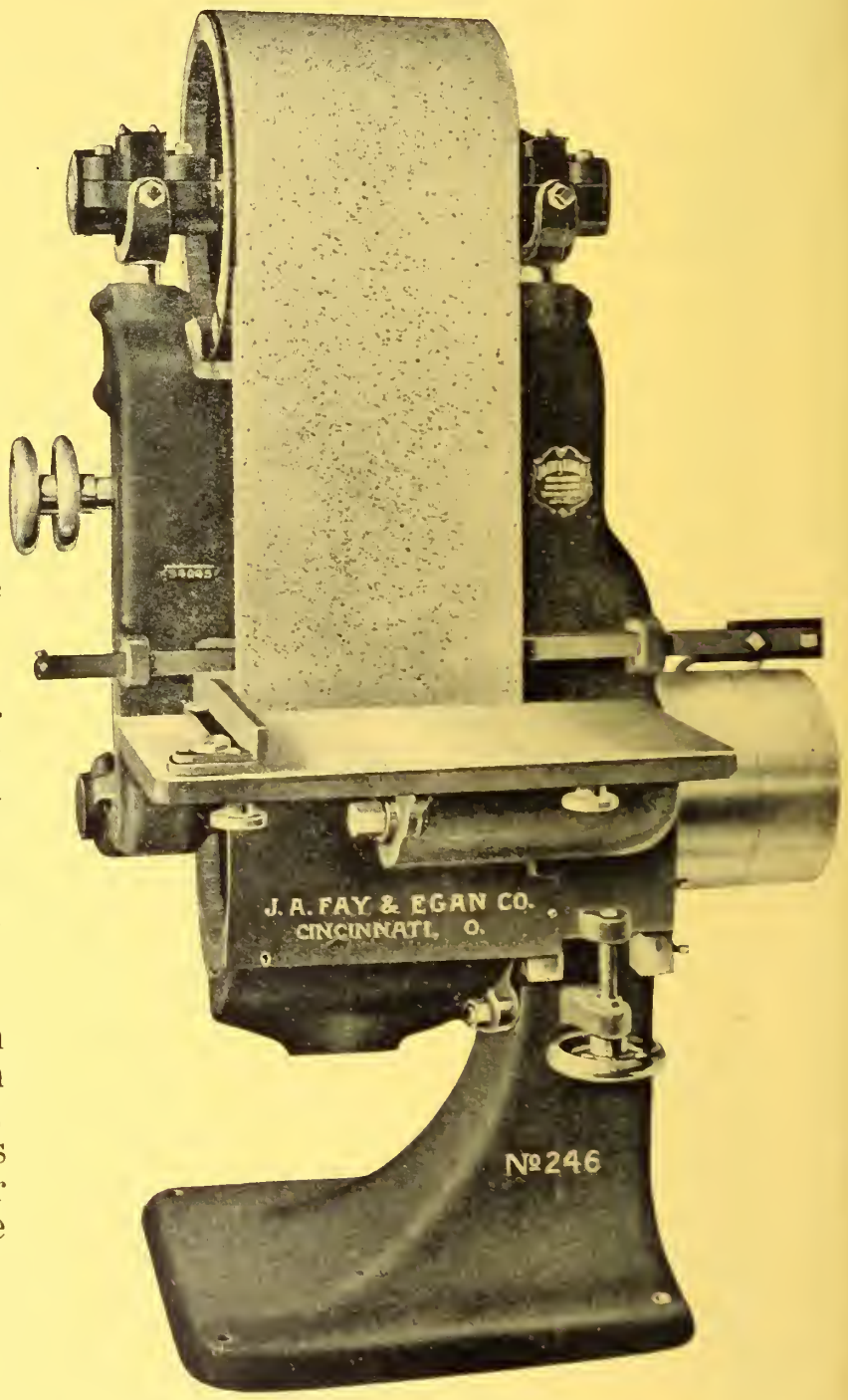
COWAN & COMPANY OF GALT LIMITED
Galt, Ontario, Canada

Alphabetical Index to Advertisers, Page 12

Your Assembled Work

Polished and Squared on the No. 246

Vertical Belt Sander



Machine has a sanding surface of 14 inches wide by 24 inches high.

Table is conveniently arranged for vertical adjustment to angle either toward or away from machine.

Massive construction prevents all vibration.

When arranged with special table it makes an ideal pattern shop grinder, and many times proves superior to the disc grinder and takes the place of the trimmer and hand tools.

J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St. - - Cincinnati, Ohio, U. S. A.

Exclusive Agents for the Dominion: A. R. Williams Machinery Company, Ltd., Toronto, Ont.
Branches: Montreal, St. John, N. B., Winnipeg, Vancouver

FIRE!

IN YOUR FINISHING ROOM

What Would it Mean to You?

Fire comes suddenly and without warning to those who are unprepared. It may destroy the work of years in a few short hours. Can you afford to take these chances? The highly inflammable nature of your finishing-room materials makes your fire risk doubly dangerous.
Many buildings have escaped total destruction only because the fire was confined to the room where it started, by the Gyproc Wall Board used in its building. These experiences have led many others to secure the same protection. One factory building this past summer was struck by lightning and was not destroyed, Gyproc was used on the roof in place of wood sheathing.

GYPROC

WALLBOARD

is in reality a large, strong sheet of pure Gypsum Rock. It is the only wall board that is fireproof, yet it costs no more than others. Gyproc Wall Board has received the endorsation of the fire chiefs of Canadian cities and towns. Its fire-proofing qualities are officially recognized by the Fire Underwriters Association in the reduced insurance premiums on buildings where it is used. With this feature it combines perfect insulation, permanence, utility and economy.
Let us show you what it can do for you.

WRITE TODAY FOR
FULL PARTICULARS

The Ontario Gypsum Company

Limited

Head Office - Paris, Ont.

Branches

374 Beaver Hall Sq., Montreal 106 Don Esplanade, Toronto

Mills at Caledonia, Ont. and Lythmore, Ont.

Take the Word of Men Who Know About Drying Costs

Send for this book today

THERE'S only one way for you to be absolutely sure about the savings in Cutler drying methods **before** using Cutler Kilns yourself—and that is, to get the experience of men who already know by actual use what Cutler **has done** for them.

Every Cutler user has given us his record of results with the most enthusiastic endorsement. To some the lower cost of fewer kilns was Cutler's greatest value! To others, cutting the drying time in half was the real profit-making factor. To still others, the uniform high quality of Cutler dried lumber, was its strongest point.

So, from all these we have selected a dozen letters, signed by men you probably know, and have put them in a little book titled "Better Drying in Half the Time." You can bank on the statements of those men and you should read them without fail before buying new kilns or repairing your old ones.

Send for your copy of "Better Drying in Half the Time" today. Cutler economy starts the minute you close the door on your first load.

All essential features of Cutler Kilns are fully protected by mechanical and process patents granted and pending.

Dry Kiln Department.

CUTLER DESK COMPANY

Dept. F. Buffalo, N.Y.

Cutler KILNS

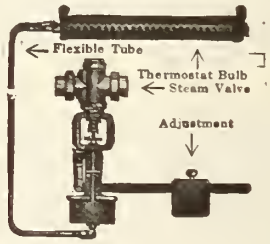
Better drying in half the time

The Certain Method of Controlling Heat Temperature is the POWERS *Method*

You secure the best service possible, when you install Powers Specialties on your hot water tanks, shower baths, in varnish rooms, on glue kettles, dryers, and any manufacturing process where heat is a factor.

The Powers Automatic Heat Regulator is the "Tireless Watcher" on any process requiring accurate temperature to assure perfect results.

The Powers Regulator No. 15



This Regulator is designed for the control of air temperature in drying rooms of all kinds. Can be stepped up or down at will. Easily installed. Entirely automatic, reliable and accurate.

Ask for Bulletin 138.

Adjusted to desired temperature, it will maintain that temperature without variation, and calls for no further adjustment.

Powers Heat Regulators save labor, save material, and insure safety and satisfactory results wherever installed.

Their principal value lies in simplicity of construction, ease of installation, and long dependable service.

Let us prove our claims in your own plant, at our risk.

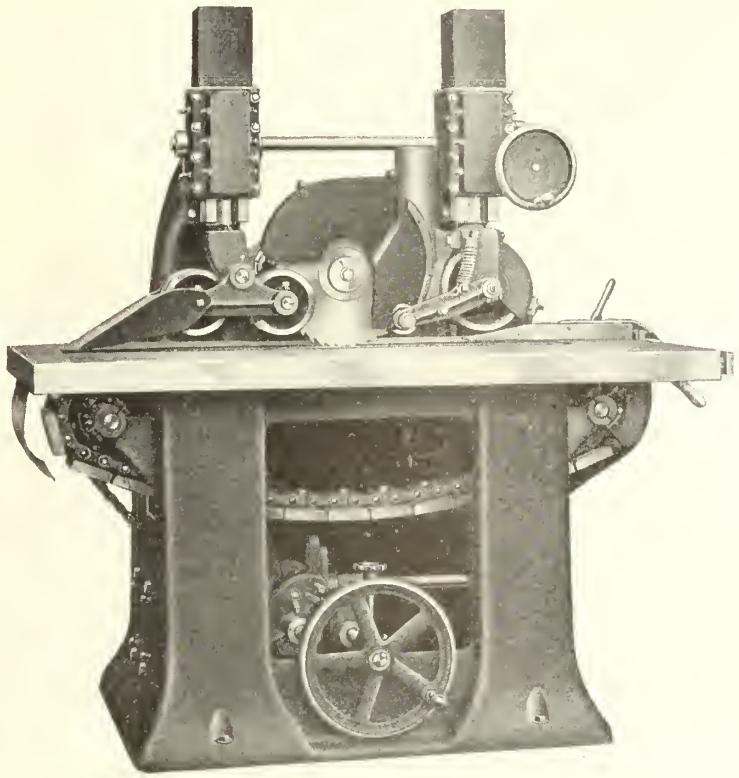
The Canadian POWERS REGULATOR CO. LTD

Specialists in Automatic Heat Control

82 Chestnut Street — Toronto, Ont.

Calgary, Alta. Halifax, N.S. Montreal, Que.
Vancouver, B.C. Winnipeg, Man.

(1859)



A Saw of Economy and Production

is the straight Edging and Jointing Saw, because—it is not necessary to allow 3/8" to 1/2" for straightening purposes. Stock cut on the Edging saw is so straight and accurate that pieces may be glued without further straightening.

This saw rips an absolutely straight line without the use of a guide. Stock once started thru at any angle holds that position until the cut is finished. It is not confined to light stuff, as two inch or four inch birch can be handled to good advantage.

The Straight Edging Saw, as a rule will do as much work as three ordinary hand feed machines. What a saving this means in labor.

The superintendent of a large plant said. "We have two of these modern Straight Edging and Jointing Saws and are particularly well pleased with them, as we get wonderful results. When we first installed these saws, we had six hand rippers and one old type self-feed ripsaw. We put out all these machines and we get the work done just the same with the two Straight Edging and Jointing Saws. The stock is always straight, and I think I am safe in saying that this machine has paid for itself each year. I certainly would not like to run a woodworking plant without one.

If you would like further data on this machine, do not hesitate to write us, we'll gladly send you circular which outlines fully our Type G2 Edging and Jointing Saw.

P. B. Yates Machine Co. Ltd.

Hamilton - Ontario

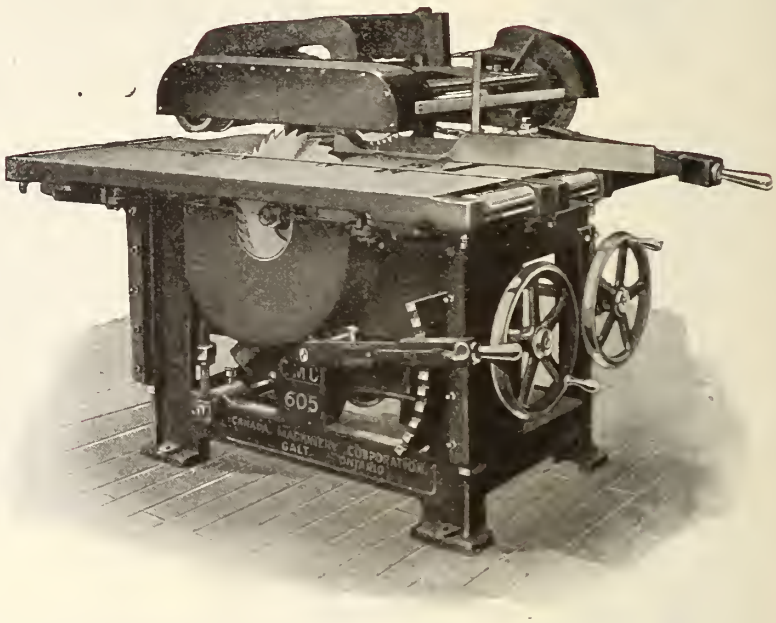
"CUSTOMER'S PROFITS Our First Concern"

We know that if we produce such machines as will give a customer greater facilities; that will reduce his cost of production; will increase his output and protect his employees from accident and body wrecking toil, we can be assured of his patronage.

The 605 Self feed Rip Saw is a profit maker

It will save more lumber
It will save more time
It will save more power
It will save more labor
and will
Do more work
Do better work
Give longer service
and better satisfaction

Than any other self feed saw on the market.



The 605 Self Feed Saw is selling Fast—It is one of

C.M.C.

The BETTER LINE

The C. M. C. Man can tell you "why" and is just "a-bustin'" full of enthusiasm to show you the reasons and a lot of other facts.

Patents are Pending. *Originality Merits Protection*

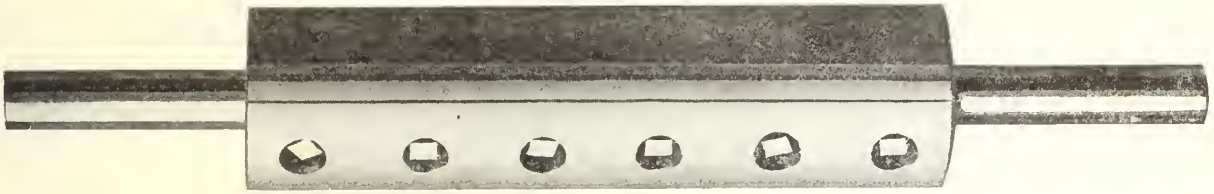
CANADA MACHINERY CORPORATION
LIMITED

Manufacturers of Wood and Iron Working Machine Tools

GALT ONTARIO

Toronto Sales Office, - 721 Bank of Hamilton Bldg.

The Shimer Round Safety Cylinder with High Speed Knives



A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for any of the Different Makers' Machines and in Any Length Cylinder

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

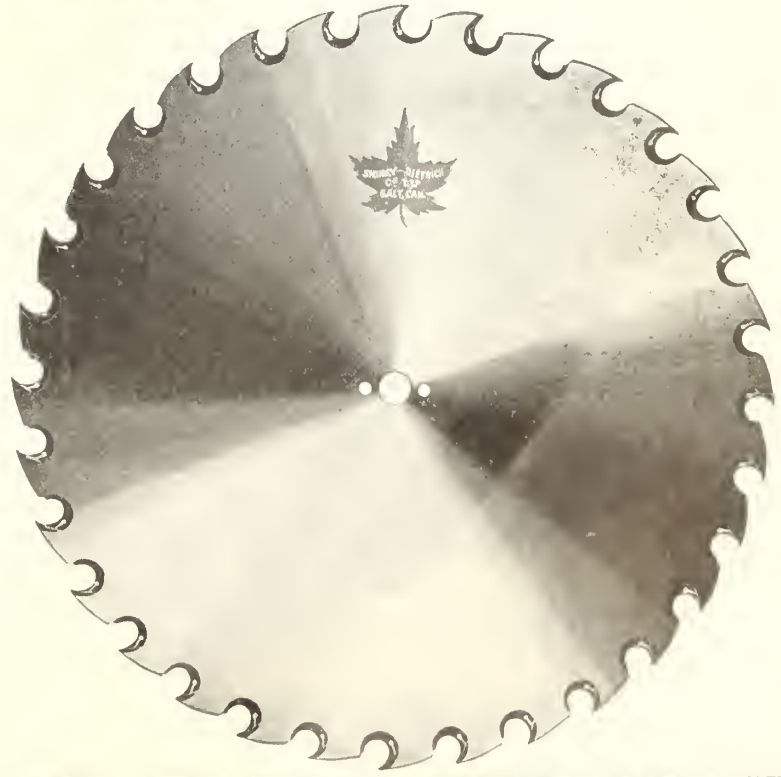
Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

MAPLE LEAF SAWS

There is a Maple Leaf Saw for every type of work – one that will reduce your cutting costs.

Maple Leaf Saws are made of extra refined Razor Steel tempered by our secret process.



Shurly - Dietrich

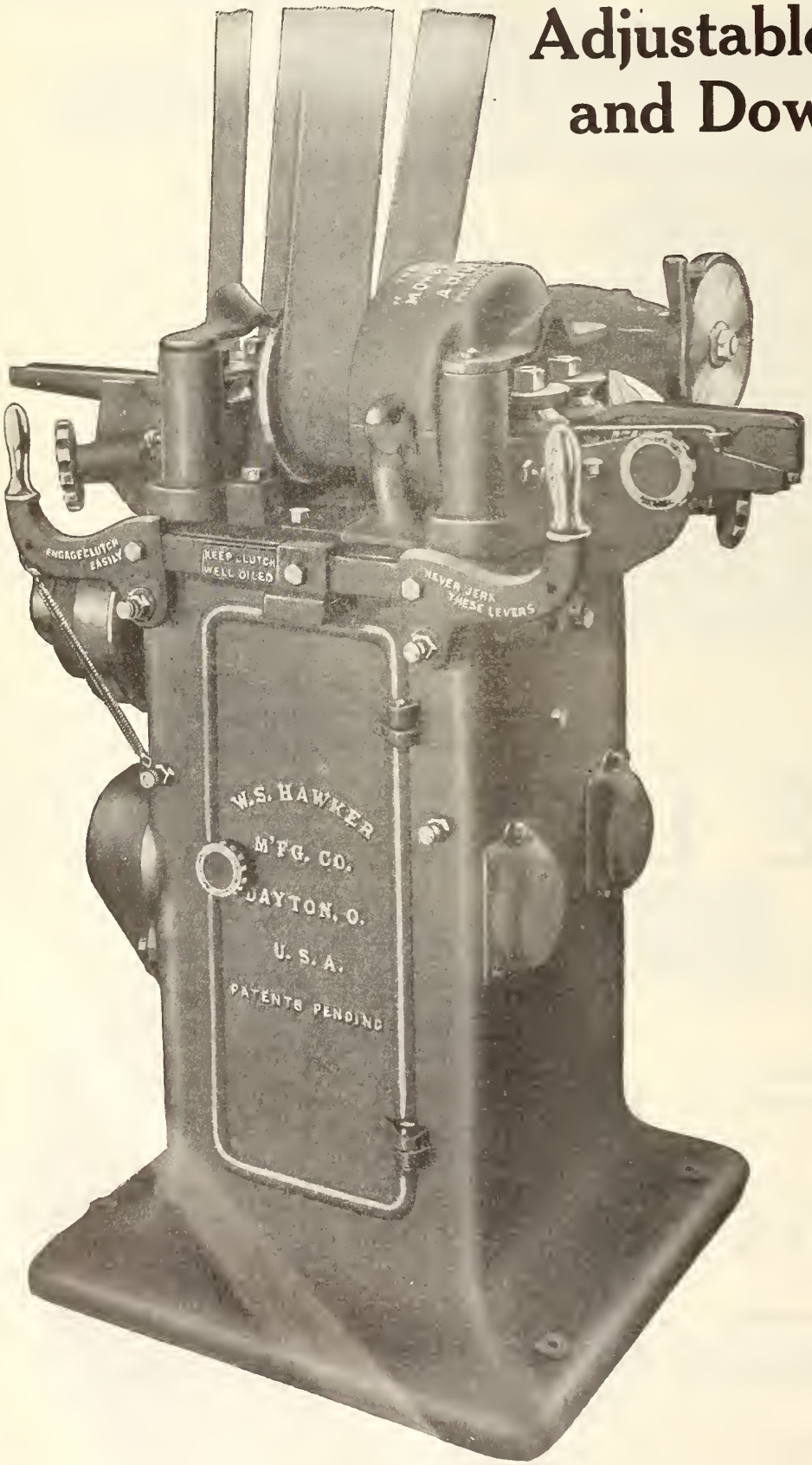
Limited

Galt - Canada

Store and repair branches at Vancouver

"The largest all-Canadian saw manufacturers."

The Money Maker—
Adjustable Rod and Dowel Machine

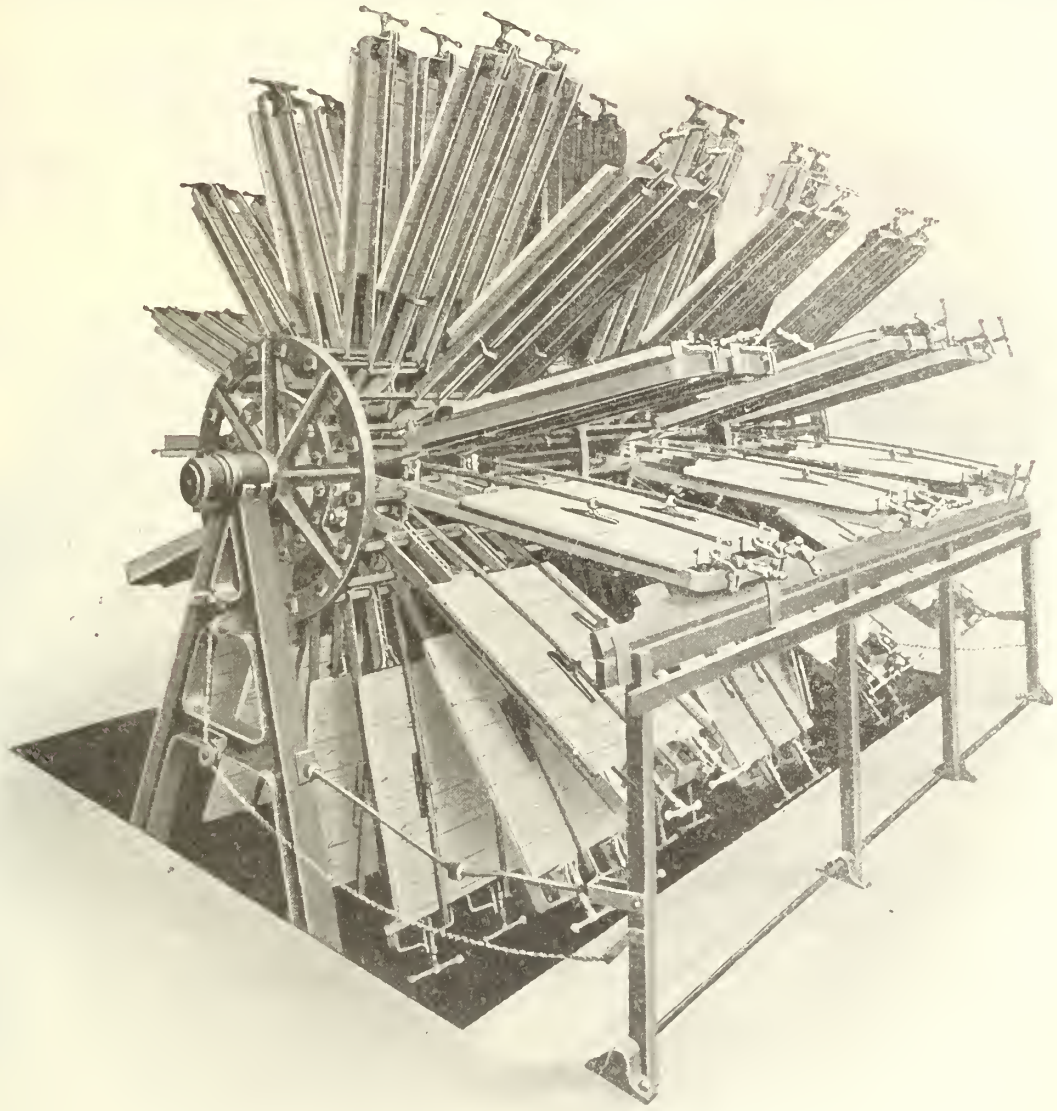


Capacity 30,000 to 40,000 lineal ft. per ten hours on 7/8 or 15/16 mop or sweeper handle stock.
If you are using any dowel machine of less capacity, figure your daily losses in labor and business.
Write us what dowel sizes you turn, and whether hard or soft wood. Ask for our demonstration proposition to show you how to double your production of dowel stock at the same labor cost.

The machine that is sent under a guarantee to show you a gain of from 100 to 400 per cent before you buy it.
The improved dowel machine that 90 per cent of the largest and oldest machinery builders and dealers now endorse and recommend in preference to the solid chuck machines they themselves previously built.
One cutter head turns from ¼-in. to 2-in. diameter.
Turns hard or soft wood equally well.
Handles heavy, oversized squares.
No choking of the cutter head.
Smooth stock.
Accurate sizes.
Works stock as short as five inches.
Rolls automatically center variations in squares.
Machines built to turn from ⅛ to 6-in.
We want to hear from every user of a solid chuck dowel machine.
We can save you from one dollar out of every two, to four out of every five that the operation of solid chuck machines costs you.
Engagements for competitive test solicited.
Formal orders not solicited. All sales made after demonstration.

The only question is, are you willing to cut cost of your dowel turning to one-half or one-third of what it costs with any make of solid chuck machine?
Machine delivers the goods before you buy.
State conditions of stock closely
Special conditions require special equipment.

W. S. Hawker Mfg. Company, Dayton, Ohio



For Cores and Solid Work

This machine is scientifically designed and constructed to insure the greatest efficiency together with simplicity of operation.

It insures the rapid making of good glue joints and holds the stock off the floor until the glue has set.

With this clamp one man can produce more and better work than two can produce under old methods.

It will prove a wonderful investment for any plant where a quantity of edge gluing is done.

It is made in sizes to suit customers requirements.

Each clamp is equipped with side brackets for short stock and a spring steel binder for thin stock.

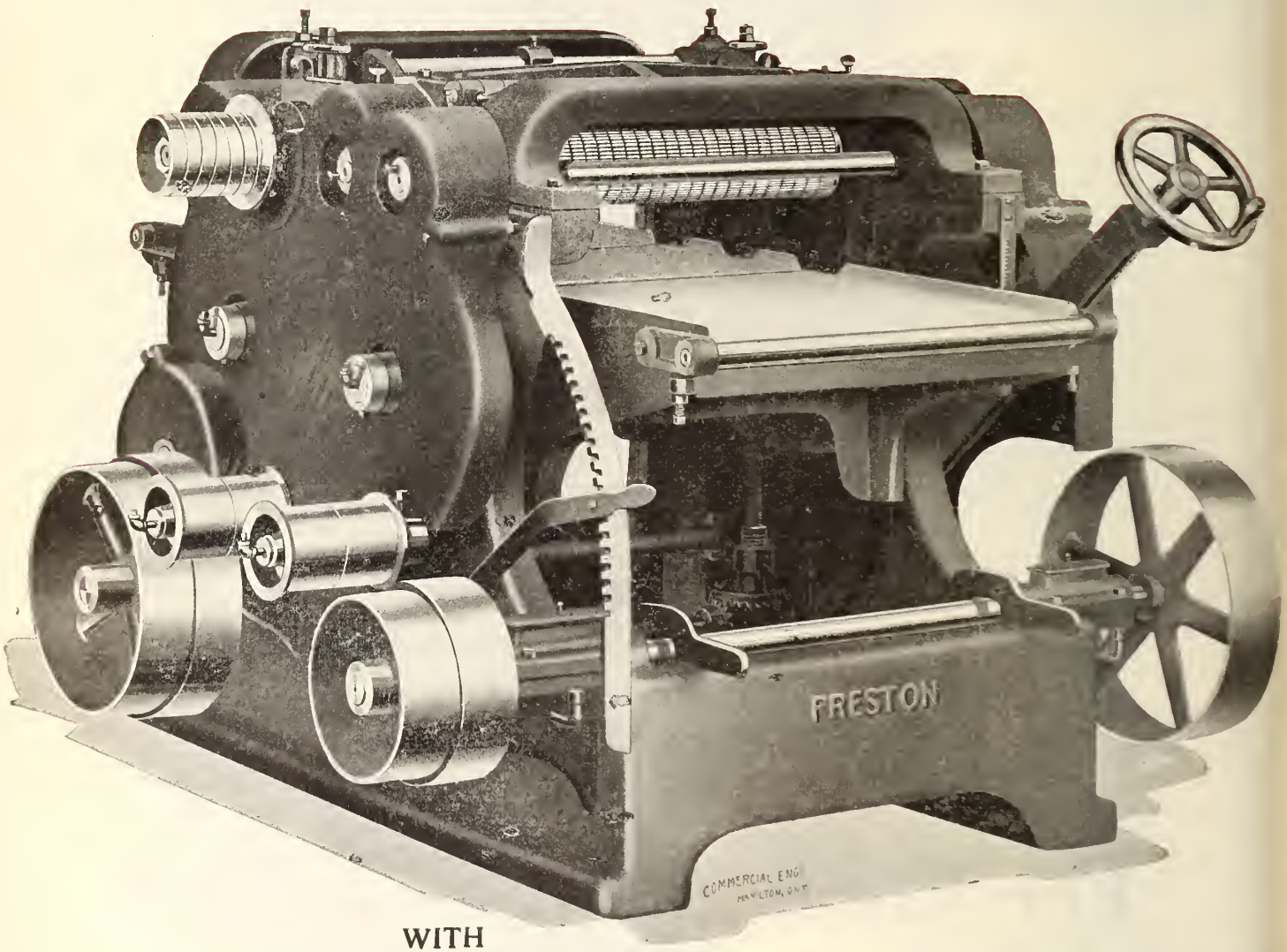
Unequalled for clamping chair seats, furniture, dimension stock, school desks, panels, tops, etc.

Descriptive circulars and information gladly furnished on request.

Jackson, Cochrane & Company

Manufacturers of Woodworking Machinery. : KITCHENER, ONTARIO

No. 123 "Preston" High Speed Ball Bearing Surface Planer



WITH

(1) Specially selected S.K.F. Ball Bearings (2) Sectional Roll and Sectional Chipbreaker (3) Round Cylinder with 4 High Speed Knives (4) Stockbridge Knife Grinder and Jointer (5) Cylinder Speed, 6000 r.p.m.

Could you come to Preston and let us show you a machine in action.
We will prove that it will:—Firstly, eliminate 75% of the ordinarily necessary sanding. Secondly, increase your production one hundred fold. If it will do that, you should have it.

We take this opportunity to wish our customers "A Merry Christmas and a Prosperous New Year."

The Preston Woodworking

PRESTON,

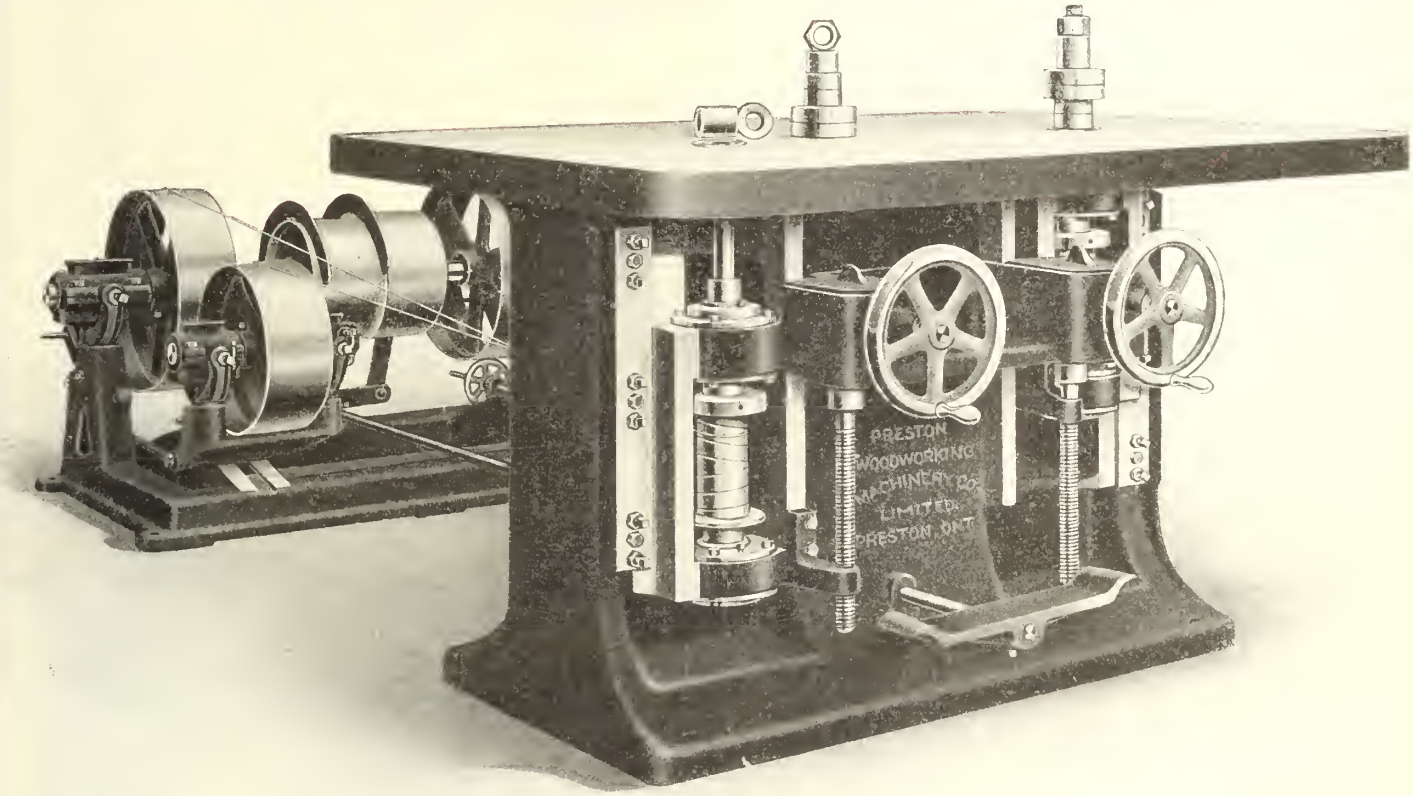
We are Sole Manufacturers of and Agents in Canada for the Eaglesfield Patented Beltless Swing Saw

? ? WHY NOT ? ?

Save $5.00 Every Day

By Installing a

Preston Heavy High Speed Ball Bearing Shaper



Built with either one or two spindles

IT WILL

1. **DOUBLE** your shaper production.
2. Vastly increase the quality of your work.
3. Pay for itself in 6 months.
4. Be much easier on your operator.

MORE PRODUCTION is the big cry in the world today
and **LABOR SAVING MACHINERY** is the only answer.

Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

Alphabetical List of Advertisers

American Walnut Mfrs. 31
American Plywood Corp. 39
Adjustable Clamp Co. 21
Anderson, Shreiner & Mawson 32
Atlantic Lumber Co. 48
Atkins & Co., E. C. 107
Atlas Mfg. Co., of Orlando 30

Batavia Clamp Co. 21
Banning, Leland G. 49
Behr Co., Inc. Herman .....
Bigelow-Cooper Lumber Co. 47
Barr-Holaday Lumber Co. 35
Birds Eye Veneer Co. 78
Black Bros. Co. 25
Blocksom & Company 71
Bruce Woodworkers Ltd. 30
Brown Corporation 34
Buffalo Hardwood Lumber Dealers 42
Bury & Co., Robt. 50

Canada Machinery Corporation 6
Canada Wood Specialty Co. 46
Canadian Appraisal Co., Ltd., The 103
Canadian Blower & Forge Co. 107
Canadian General Lumber Co. 89
Canada Glue Co. 18
Canadian Powers Regulator Co. 4
Canadian Nashua Paper Co. .....
Canadian S. K. F. 99
Cannon Canadian Co., Ltd. 18
Carborundum Co. 101
Carter & Co., E. T. 76
Casein Mfg. Co. 18
Celluloid Zapon Co. 76
Chapman & Dewey Lumber Co. 29
Clamp Nail Co. 38
Clark Edward & Sons, Ltd. 44
Coignet Chemical Products Co. 18
Comfy Cushion Co. 71
Cosmos Chemical Co. 75
Cowan & Co. 1
Cutler Desk Co. 4

Decorators Supply Co. 20
Des Moines Sawmill Co. 36
DeVilbiss Mfg. Co. 77
Dominion Appraisal Co. 103
Dry Kiln Door Carrier Co. 97

Eagle-Ottawa Leather Co. 71
Eaton & Sons J. R. 39

Farrin Lumber Co., The M. B. 50
Fay & Egan Co., J. A. 2
Foster, Merriam Co. .....
General Machinery Co. 95
Globe Vise & Truck Co. 103
Grand Rapids Vapor Kiln 13
Guelph Patent Cask. Co., Ltd. 83
Gulf Lumber & Trading Co. 41

Hardwood Mfg's. Institute 28
Hafner Mfg. Co. 46
Hartzell, Geo. W. 37
Hay & Co. 91
Hay & Co., Peter 95
Hawker Mfg. Co., W. S. 8
Hoffman Bros. Co. 82
Hyde Lumber Co. 40

Ideal Fence & Spring Co., of Canada Ltd. 72

Jackson Cochrane & Co. 9

Kane Mfg. Co. 20
Kasebier Chatfield Shellac Co. 25
Kinnon Lumber Co. 95
Klise Mfg. Co. 24
Klotz Machine Co. 103
Kosse, Shoe & Schleyer Co. 41
Kraetzer-Cured Lumber Co. 93

Cheap Workmanship Is False Economy

You cannot afford to take chances in the installation of a

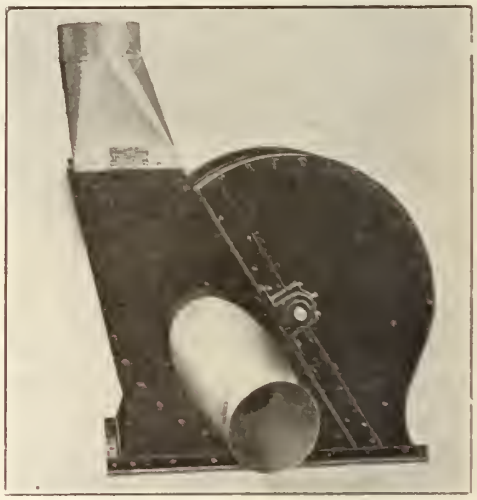
BLOWER SYSTEM

Expert workmanship spells real economy in the installation of blower systems, for it eliminates the unnecessary breakdowns and replacements that make the upkeep of a cheap system expensive.

A Toronto Blower System in your plant ensures the utmost in efficiency, for our systems are the result of long experience and exhaustive study into every requirement. One of our experts will gladly consult with you and furnish estimates.

The Toronto Blower Company
156 Duke St. Toronto

"Free your factory with a Foster Fan"



THE FOSTER FAN

The Foster Fan is the only non-centre suction fan in existence and is designed and constructed to furnish the maximum lifting power at the minimum expense. It is practically indestructible and handles all materials, wet or dry, without clogging. Installed complete. No part of installation is re-let.

IMPERIAL Tables Are Made From Stock Cured in

The GRAND RAPIDS VAPOR KILN

IT is the verdict of established and successful firms such as Imperial Furniture Co., Kroehler Mfg. Co., Berkey & Gay, S. Karpen & Bros. and more than 1,000 other leaders in the Furniture Industry that the Grand Rapids Vapor Kiln deserves the credit for the greatest single improvement of the decade in wood curing methods.

St. Johns Table Co., Sligh Furniture Co., Wm. French & Son, Inman Furniture Co., and hundreds of other manufacturers of famous products not only know from long experience that the Grand Rapids Vapor Kiln means a better product at less expense and with more profit, but they back that knowledge with repeat orders for more and more Grand Rapids Vapor Kilns as production requires enlarged curing capacity.

Imperial Furniture Company, having replaced various other kiln equipment with 12 Grand Rapids Vapor Kilns, find that curing capacity is not only increased at less cost for drying but that waste common to other methods is entirely eliminated and curing time radically cut in spite of better results. These views illustrate yard layout, operating pit and transfer track of battery entirely designed and installed by us.

We maintain, as the very foundation of our continued leadership, America's most highly specialized and efficient laboratory service serving the woodworking industry. Technical bulletins covering practically every phase of wood curing problems are yours FREE upon request and the personal service of our corps of experts here and abroad is offered without placing you under the slightest obligation. Write us.

GRAND RAPIDS VAPOR KILN

Engineers, Manufacturers, Contractors

Main Office and Factory: GRAND RAPIDS, Mich., U. S. A.

FOREIGN OFFICES:

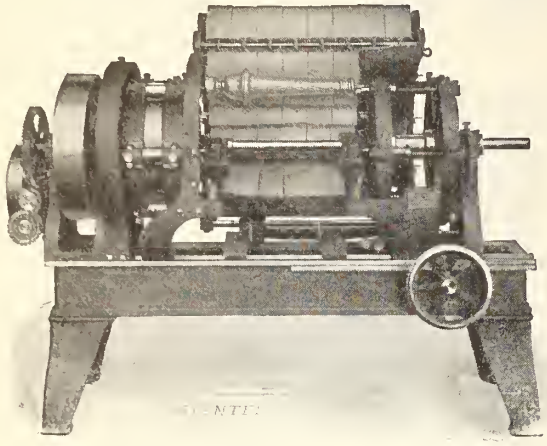
BOORMAN & BOORMAN
Sydney, Australia

THE OLIVER MACHINERY CO.
Manchester, England

A. R. WILLIAMS MACHINERY CO.
St. John, N.B.

HAMPE & HARTWIG,
Hamburg, Germany

IS YOUR SANDING DEPARTMENT



holding up the prompt filling of your furniture orders?

Install a Nash Sander for your furniture turnings and you will wonder how you ever got along without it.

J. M. NASH, Milwaukee, Wis.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.

'Twas the Night before Christmas!

'Twas the night before Christmas,
And all thru the kiln
The warping and checking
Were bothering old Bill.
So he called up old Santa
and said, "Say friend clause,
Wont you do me a favor
And bring for the Boss
That new book on the kiln
That's so easy to run?
Not one long on 'claims,'
But a much surer one,
That dares point to users
And willingly say,
'Ask them—direct—
That's the surest way.'
Just write to The Standard,
1542 McCarty St.
The book they will send
Is valuable, complete.
If you'll do that, Friend Santa,
You'll help us all the year;
For the results will mean profits
As well as good cheer."

A Merry Christmas

The STANDARD DRY KILN CO.
Indianapolis, Ind.

Greetings to the Glue Using Trade

THE Spirit of Christmas prompts us to extend to you our appreciation of your good will which has helped immeasurably to make our serving you a pleasure.

May the New Year hold for you a rich abundance of Happiness and Prosperity.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office.
South Bend, Indiana.

Alphabetical List of Advertisers—Continued

Laidlaw Bale-Tie Co. 97
Larson & Shaw Ltd. 25
Litton Veneer Co. 81
Long-Knight Lumber Co. 91
Luehrmann Hardwood Lumber Co. Chas. F. 34

Marietta Paint & Color Co. 72
Mattison Machine Works 108
May Hardwood Co., R. R. 34
Maus, Chas. O. Lumber Co. 34
McKnight & Son Co., L. G. 14
Memphis Bandmill Co. 25
Memphis Veneer & Lumber Co. 83
Mercereau Hawkins Tie Co. 40
Mohawk Veneer Co. 82
Monite Waterproof Glue Co. 19
Morgan Machine Co. 105
Mowbray & Robinson 29

Nash, J. M. 14
National Dry Kiln Co. 17
National Patent Reed Sales Co. 46
Nichols & Co., A. S. 77
Nickey Bros. .....
Northwestern Cooperage & Lumber Co. .. 81

Oakey & Sons, John 25
Ober Manufacturing Co. 38
Ohio Veneer Company 81
Oliver Machinery Co. 38
Ontario Gypsum Co. 3
Ontario Handle Co. 97
Oriental Textiles Co. 75
Otis Mfg. Co. 45
Overton, S. E. 24

Pannill Door Co. .....
Pedwell Hardwood Lumber Co. 43
Pembroke Plywood Co. 30
Penrod Walnut & Veneer Co. 82
Perkins Glue Co. 15
Pettingell Machine Co. 95
Pickrel Veneer Co. .....
Porter Machinery Co., C. O. .....
Preston Woodworking Mach. Co. 10-11

Radcliff Saw Mfg. Co. 16
Reese-Sheriff Lumber Co. 47
Richards-Wilcox Canadian Co. 95

Shantz, P. E. 30
Shimer Cutter Head Co. 7
Shurley Dietrich Co. 7
Sidmans of Canada, The 89
Simonds Canada Saw Co. 106
Sondheimer Co., E. 48
Stack Lumber Co. 49
Standard Dry Kiln Co. 14
Stark & Co., Jas. E. 39
Steele & Hibbard Lumber Co. 39
Stimson & Co., J. V. 40
Stimson Hardwood Co., J. V. 33
Stimson Veneer & Lumber Co. 33
Sturtevant Co., B. F. 21
St. Joseph Iron Works 105

Taylor Mfg. Co., Jas. L. 104
Toronto Blower Co. 12

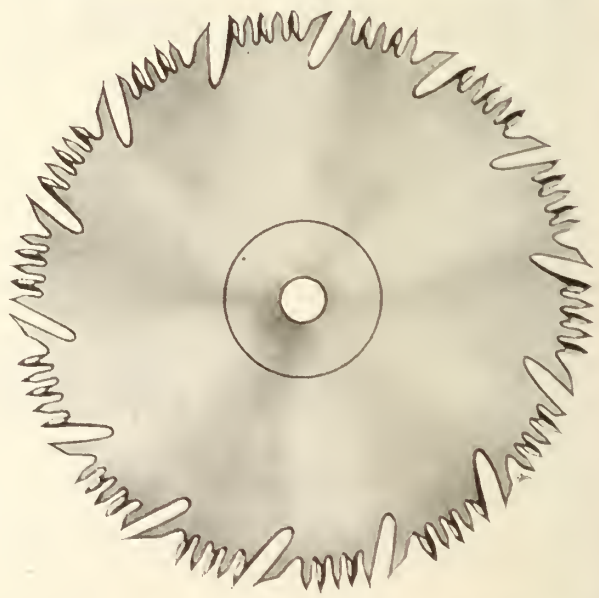
Vandergrift & Morris 97
Veneer Manufacturers Co. 83

Waddell Mfg. Co. 24
Walter & Sons, J. 23
Watertown Table-Slide Co. 41
Willey Co., C. L. 87
Williamson Veneer Co. 84
Wisconsin Veneer Co. 81
Wood Mosaic Co. 85
Wylie Mathew 27

Yates Machine Co., Ltd. P. B. 5-27
Yellow Poplar Lumber Co. 48
Young Lumber Co., Bedna 40

Only Cheap Saws are Expensive

Beaver Brand Saws are made to endure—to give long service and to hold their cutting edge. That is why they invariably prove economical. Were you able to follow a Beaver Brand Saw through all the stages of manufacture, from the crucible to the final inspection, you would declare without hesitation "Here is a saw that will endure."



Give your saw repairs into the hands of our experts. Be sure that name of owner appears on each saw, and mail full instructions of work to be done, stating the hand, speed and feed of mill together with shipping directions for return of saws.

Radcliff Saw Manufacturing Company, Limited
1550 Dundas Street West **TORONTO, ONT.**

If Santa Claus had delivered all the National Dry Kilns bought by Canadian plants during 1922 he would have had to be on the job every month of the year. His time would have been so occupied that many Canadian children would have been sorely disappointed.

The National Dry Kiln Company

Wishes you a Merry Christmas

1117 East Maryland Street, Indianapolis, Indiana

Branches: New York City Memphis Toronto, Can.

BULL DOG
CERTIFIED JOINT GLUE

"WHAT WE GLUE WE HOLD"
MADE IN CANADA
BY
CANADA GLUE COMPANY
LIMITED
BRANTFORD, ONT.

UNIFORMITY

When used in describing a **Cannon Glue** is more than a claim. It is an established **fact!**

We have customers in Canada who have used one brand for fifteen to twenty years without one cause for complaint.

CANNON CANADIAN CO., LTD.
TORONTO MONTREAL

COIGNET FRENCH GLUES

Make the Strongest and Most Durable Joints

Scientifically Graded

Each Sheet Stamped with Grade Name or Number

Uniformity Guaranteed

Stocks Carried at Montreal

COIGNET CHEMICAL PRODUCTS COMPANY
17 State Street NEW YORK CITY

"Casco" for better product

YOUR confidence in your product is shared by your customer when he knows that

WATERPROOF GLUE
grips the Veneers or thejoints.

Write for "CASCO" Red Book a manual on Veneers, Panel-making and Glue. Samples of "CASCO" on request.

"CASCO" is
Incredibly Strong
Mixed in Cold Water
Most Economical

Casco-made woodwork can be subjected to extreme variations in temperature and moisture without fear of separation.

The Casein Manufacturing Company
Largest and Longest Established Manufacturers of Casein Products in America
15 PARK ROW, NEW YORK CITY

Plywood door for exterior use.
Made by Rockwell Mfg. Company

Monite Waterproof Glue
endures changing extremes of moisture, heat and cold—for interior or exterior work.
Monite Sticks to Its Job

This Plywood Door for Exterior Use

Extract from a recent letter:

Milwaukee, Wis. December 19, 1921

"It is a source of satisfaction to recommend Monite Glue as entirely satisfactory for all woodwork purposes. During three years of constant use of Monite Glue no complaint of our products has been received. In addition, it saves time and labor because of the simplicity of its preparation. It covers 15-sq. ft. more of surface per pound than any other glue we have used. It has always proven dependable."

—The Rockwell Manufacturing Co.

Until Monite Waterproof Glue became available, all attempts to use plywood for outside doors, failed. They would not stand up under exposure to sun, rain, frost and snow.

The Rockwell Manufacturing Co.'s plywood doors made from selected wood of the highest quality, and glued with MONITE, are as beautiful as they are durable. They are sold, not only in every state in the Union, but throughout the world—and no condition of outdoor climate has yet been found too severe for them.

For, Monite Waterproof Glue endures all extremes of dry and wet, heat and cold. It gives the manufacturer new sales possibilities for his products—and insures satisfaction. New products in almost every woodworking line are made possible by Monite Waterproof Glue.

Get our vest-pocket sample panel of Monite-made plywood. Boil, bake, soak or steam it—MONITE STICKS TO THE JOB.

MONITE WATERPROOF GLUE CO.

Manufacturers of Cold Glue in Powdered Form

1628 North 2nd St., Minneapolis, U.S.A.

Cable Address: Monite—Minneapolis

Canadian Representatives:

W. H. CUNNINGHAM & HILL, LTD., 269 Richmond St., W., TORONTO, CANADA

STOCKS AND REPRESENTATIVES IN ALL PRINCIPAL CITIES.

KANE VEGETABLE GLUE

Our Comebacks are Duplicate Orders

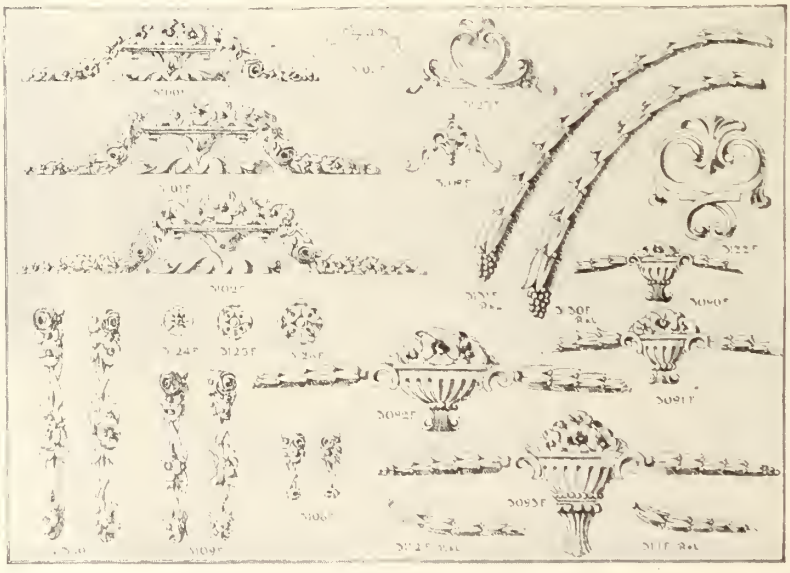
Manufactured by,

KANE MANUFACTURING CO.

1832-34 South Clark Street CHICAGO, ILL.

PERIOD CARVINGS
for FURNITURE

Largest Manufacturers of Imitation Wood Carvings in the World Quality the Best. Prompt Shipments



Unlimited Facilities for Manufacturing High Grade Wood Carvings in Composition and Wood Fibre

Reproductions of Exclusive Designs Our Specialty

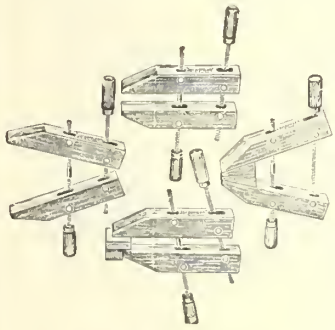
THE DECORATORS SUPPLY CO.

2543 ARCHER AVENUE, CHICAGO

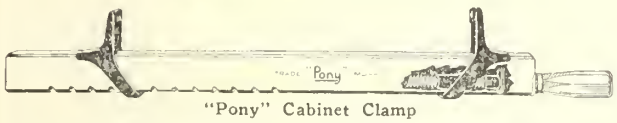
New Catalog Sent on Request

The "JORGENSEN"
Steel Spindle Hand Clamp

10 sizes Adjustable 10 sizes Rigid Jaws



The truth is the "JORGENSEN" is not constructed down to a price but up to a standard—If you need hand screws, why not get the best, and save money, look for the name "JORGENSEN."



"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.

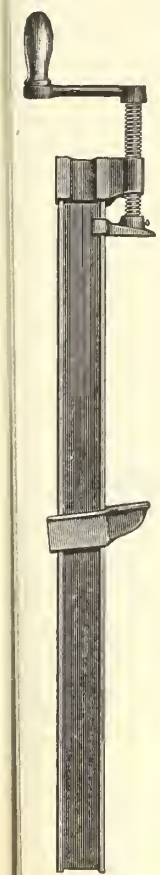
Manufactured only by the

Adjustable Clamp Company

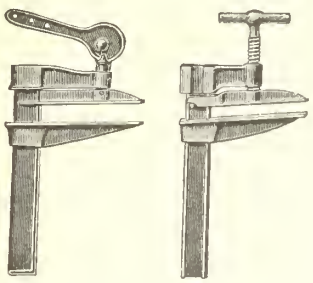
216 N. Jefferson St., Chicago, U.S.A.

For Sale By

Aikenhead Hardware Limited .....Toronto
Lewis Bros., Limited .....Montreal



Colt's Clamps
for the
Woodworker



Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.

3½x10—Canadian Woodworker—December, 1922

Sturtevant
PUTS AIR TO WORK

This Mark on the Kiln

means better furniture. Better furniture means more customers, a better business —*and* more profits.

Sturtevant sales-engineering service will show you definitely how to save time and handle more lumber with less overhead.

Get folder 602
and start your profits
coming faster

B. F. STURTEVANT CO.
OF CANADA, LTD.
MONTREAL GALT TORONTO

Making Fifty Thousand Business Calls a Month

EVERY month fifty thousand copies of our business and technical publications reach Canadian business men.

Fifty thousand times a month Canadian business learns how to make, sell or do something better than before.

Fifty thousand times a month our advertisers appeal to real buyers and hold their interest, reaping excellent returns.

Lowest Rate per Interested Reader

Hugh C. MacLean Publications

Electrical News
Canada Lumberman
Footwear in Canada

Canadian Woodworker
Western Contractor and Builder
Contract Record & Engineering Review
Commercial & Retail Merchants' Review

Furniture World
Western Lumberman
Western Coal Review

Head Office : 345 West Adelaide Street

Vancouver Chicago Toronto Montreal Winnipeg

The largest publishers of technical papers in the British Empire, printing in Toronto, Winnipeg and Vancouver. Proprietors of MacLean Building Reports Limited.

"Wishing you happiness every moment of Christmas and success every day of the New Year"

JOHN WALTER & SONS LIMITED

KITCHENER :-: ONTARIO

Overton Fine Benches

OUR peculiar construction makes every Bench permanently durable. Careful workmanship, dignified designs and a beautiful finish. We can exactly match any standard instrument.

We also specialize in large quantity production of Bench parts, phonograph legs and parts, table and floor lamps, and fine turnings and carvings of every description.

Our fine organization of skilled workmen assures high quality at the lowest prices.

Your own designs promptly and faithfully reproduced. Consult us.

The No. 45 Duplex, Duet Width

S. E. OVERTON COMPANY

South Haven MICH. U.S.A.

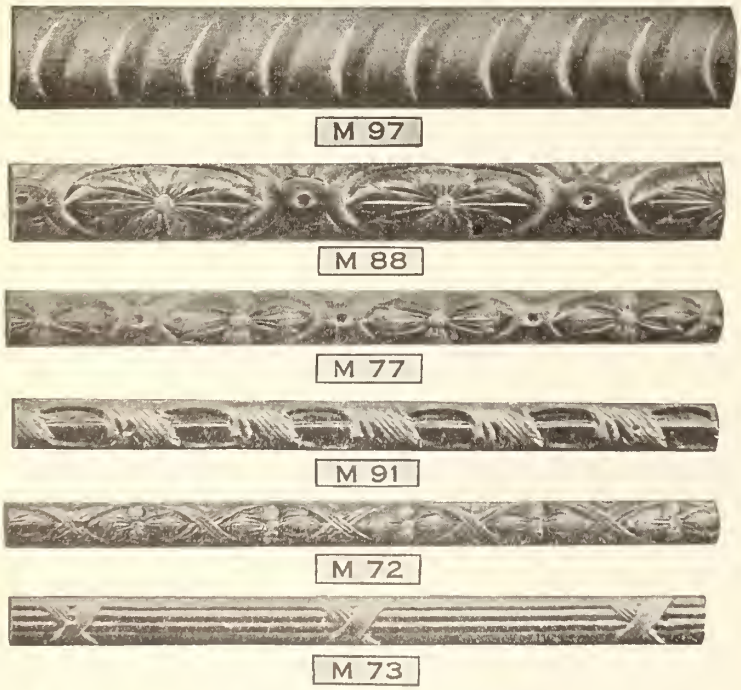
CARVED MOULDINGS, CARVINGS, CARVED LEGS

No. D-775 (Reduced One-Half)

No. D-763 (Reduced One-Half)

"KLISE" mouldings are carved, not pressed. Made in several hundred classic, period designs, in various sizes and shapes. Catalogue of legs and samples of mouldings sent on request. Send us your designs or samples of carvings for quotation.

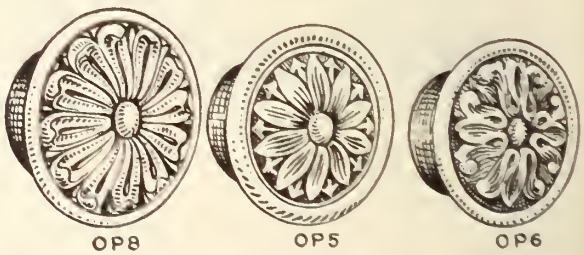
KLISE MANUFACTURING COMPANY
Grand Rapids, Michigan



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.



Waddell Manufacturing Company

Coldbrook and Taylor, N. W. **Grand Rapids, Mich.**

BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A

Subscribe for the
Canadian Woodworker

and

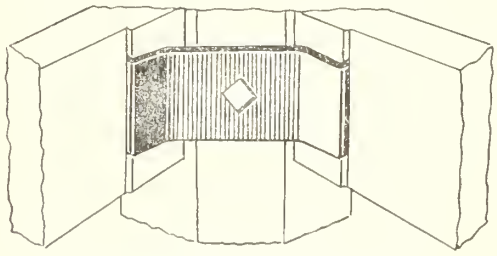
Furniture Manufacturer
Only $2.00 per year

Kasebier Quality
Kiln Dried Bleached

SHELLAC

"Ask the Man Who Uses it"

Kasebier-Chatfield Shellac Co.
No. 7 Cedar St., New York



No. 23 Corner Brace

No. 43Pull

Furniture Trimmings, and Butts Special Hardware

We Also solicit your enquiry for Special Stampings

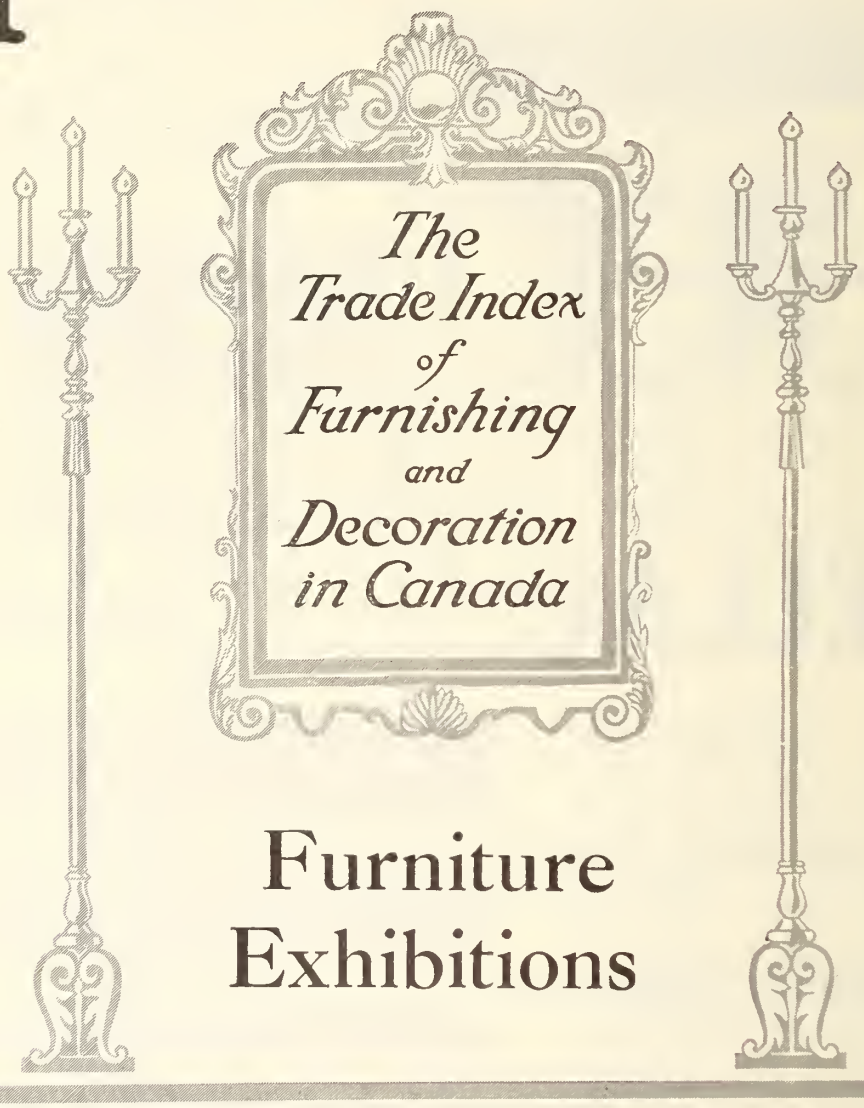
Larsen & Shaw, Limited
Walkerton, Ontario

OAKEY'S
Glass Paper, Flint Sand Paper, Garnet Paper
IN SHEETS AND ROLLS FOR ALL PURPOSES
Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide
SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers
JOHN OAKEY & SONS LTD.,
WELLINGTON EMERY AND BLACK LEAD MILLS
LONDON, S. E. 1.

Canadian Agents:
P. Manley, 290 McDermott Ave. W., Winnipeg, Man.
Sturgeons, Ltd., 64-66 Richmond St. E., Toronto.
Sankey & Manson, 839 Beatty Street, Vancouver, B.C.
John R. Anderson, 36-38 St. Dizier St., Montreal, P.Q.

Furniture World

January Number



Furniture Exhibitions

Hugh C. MacLean Publications Limited

There is still time to get your message to the retail dealer before he buys.

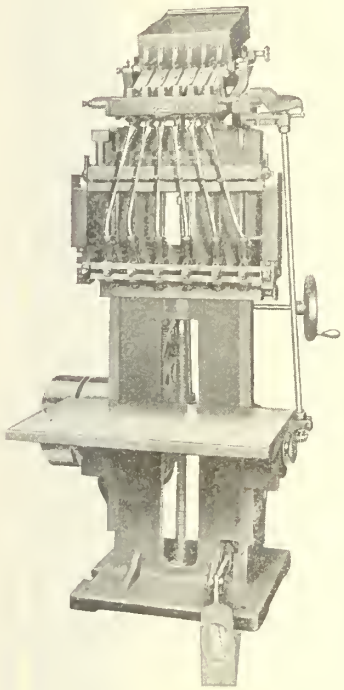
First forms close December 15th, final forms the 26th. Copies are in the mails by January 1st, before the dealer starts for the Mid-Winter Markets.

Our Service Department will help you with copy and layout. Just say the word.

26,400 New Homes

were erected in Canada in 1922. In what percentage of these homes may your furniture be found?

A SLOW PROCESS



nailing boxes by hand—expensive too. Box making costs can be—have been greatly reduced by the use of Nailing Machines, and output greatly increased with less labor.

Companies installing Nailing Machines testify to the fact that by their use box making costs have been greatly reduced, while at the same time production has been increased as high as 50 per cent. These statements are not hearsay—they are facts.

Don't hesitate to ask for information on any of our Nailing machines. We'll gladly supply it.

P. B. Yates Machine Co. Ltd.

Hamilton, Ontario

YATES

OX NAILING AND CLEATING MACHINES

ENTIRELY AUTOMATIC

EASILY OPERATED

MACHINES FOR PLAIN

OR ZIGZAG NAILING

THE GUIDING FACTOR IN THE MANUFACTURE OF OUR— MACHINES HAS ALWAYS BEEN QUALITY. THEY ARE BUILT FOR LONG SERVICE.

THERE IS NO NEED TO FIGURE OUT FREIGHT CHARGES, OUR PRICES ARE C.I.F. CANADIAN PORT

ALSO MADE FOR

CLEATING or BATTENING

INSTANTLY ADJUSTED

MADE IN ALL SIZES

MAY WE SEND YOU A CATALOGUE?

MATTHEW WYLIE & Co. Ltd.

81 PORTMAN STREET, GLASGOW

Scientific Utilization of Hardwoods from Tree Through Factory

HARDWOOD MANUFACTURERS INSTITUTE
SCIENTIFIC UTILIZATION
TRADE MARK

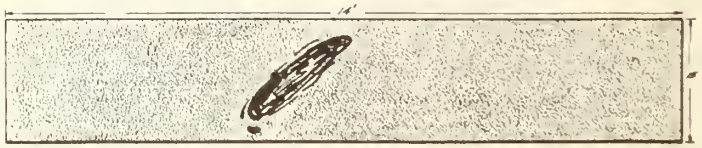
No. 1 COMMON—

(A)

(B)

(C)

(D)



All of these Boards will grade No. 1 COMMON according to existing specifications.

(A) Obviously GOOD YIELD for Toy and Novelty Plant.
(B) Obviously GOOD YIELD for Flooring Industry.
(C) Obviously GOOD YIELD for Chair Industry.
(D) Obviously GOOD YIELD for Tables and Case Goods.

And yet every class of factory buying No. 1 COMMON must accept them ALL and in no shipment does the factory know what sort of board is going to turn up.

WRITE FOR THE WHOLE STORY

HARDWOOD MANUFACTURERS INSTITUTE

1020 SOUTH WABASH AVENUE

CHICAGO

A Thirty-five Years' Unbroken Record

Of Fulfilling Sales Contracts Regardless of Market Changes

AT all times it is important that buyers of Southern Hardwoods look well into the reliability of the lumber manufacturers they deal with. It is doubly important in such times as these when the market is advancing. There are strong indications of further advances and buyers should protect themselves by placing their orders with concerns who can be relied upon to execute and fill their orders in an advancing market; who can also furnish stock fully up to grade under any conditions.

The Chapman & Dewey Lumber Company has the reputation of never having failed to fulfill a sales contract regardless of the market. This is an unbroken record extending over 35 years.

Wire our expense for price quotations

Chapman & Dewey Lumber Co.

Everything in Southern Hardwoods

Kansas City, Mo. **Memphis, Tenn.** **Marked Tree, Ark.**

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash and other Hardwoods

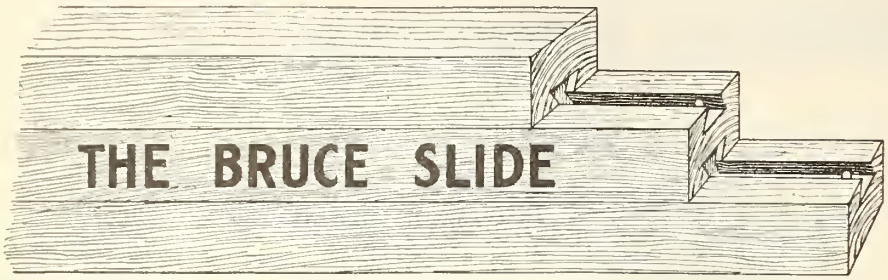
Oak Timbers and Planking

THE MOWBRAY & ROBINSON LUMBER CO.

Office: CINCINNATI, OHIO

Canadian Representative:
A. K. Johnson, Bank of Hamilton Bldg. Toronto, Ont.

TABLE SLIDES TABLE RIMS TABLE PINS



Makers of—

The "Bruce Slide"

BRUCE WOODWORKERS, Limited, Chesley, Ont.

The

Pembroke Plywood Co.

Pembroke — Ont.

Rotary Cut Veneers, Panels etc., from Native Woods.

All Panels made with best Waterproof Glue and guaranteed.

Inquiries Invited.

"The Phillips Line"

Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

Atlas Mfg. Co. of Orlando

Orlando, Fla., U. S. A.

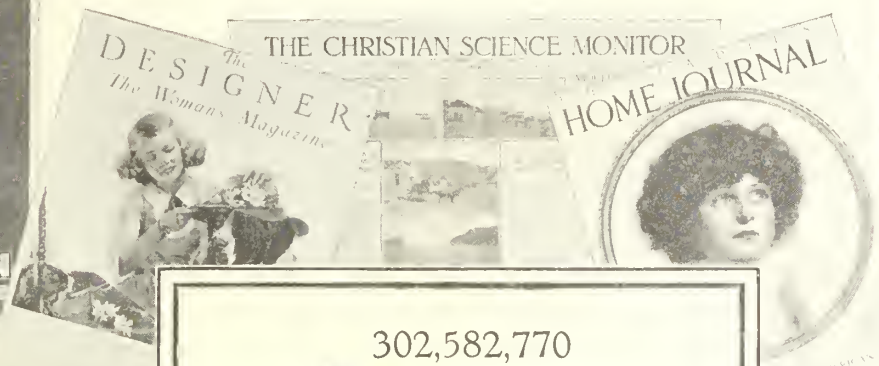
FACTORY TRUCKS

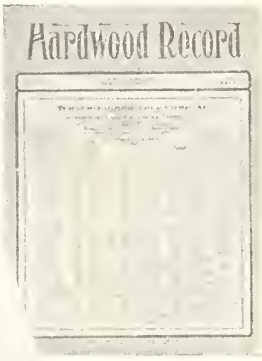
Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

MANUFACTURED BY

P. E. SHANTZ, PRESTON, ONTARIO.

Factory Truck Style No. 26.





302,582,770

AMERICAN WALNUT

Advertisements

To swell the swiftly rising tide of walnut popularity

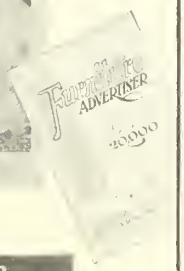
The demand for American Walnut for all purposes — furniture, interior woodwork, phonographs, fixtures, panels, radio cabinets, automobile trim, store interiors and show windows — is the unanswerable argument proving the overwhelming and growing preference of the public in its favor today.

To make the market still greater this comprehensive list of national magazines and business publications will carry the story of American Walnut during the period ending December 31, 1923. Consider what this means to you. How each of these millions of advertisements is an active sales builder for walnut you have to sell. Are you fully prepared to take care of this demand?

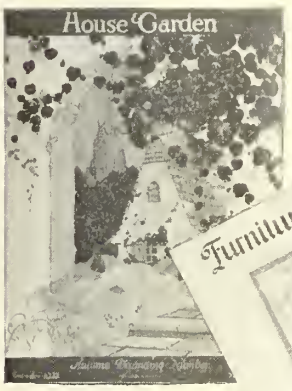
Samples of American Walnut consumer literature mailed free to you upon request

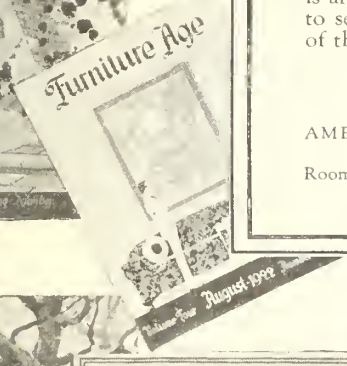
AMERICAN WALNUT MANUFACTURERS' ASSOCIATION
Room 1212 616 South Michigan Boulevard, Chicago, Ill.

"This is a walnut year"



GOOD FURNITURE *Magazine*





THE ARCHITECTURAL FORUM

OCTOBER
1922

"Better Use Birch"

The Beauty of Birch

Typically Canadian in its beauty is Birch, and compares well with the rare woods of tropical lands. Captive sunlight gleams softly in its natural coloring and adds an elusive charm to this marvelously figured wood.

The light natural shade without great variations, permits of a vast range of stains being used. The velvet surface then becomes satin for Birch is close knit and takes all finishes well.

Little wonder that the furniture manufacturer is turning to Birch, for with its great beauty it combines extreme hardness and durability. Panels of Curly Birch are particularly desirable in furniture creations.

Bedroom Suites of Birch in different finishes blend harmoniously with interior decorations and are exceptionally saleable because of their moderate price.

Produced by St. Lawrence Furniture Co.

Anderson, Shreiner & Mawson

Colonial Bldg., 13 King St. West, Toronto

HARDWOOD LUMBER

Mills at South River Ontario

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK

3	cars	4/4″	Fas.
5	"	4/4″	No. 1 Common.
1	"	4/4″	No. 2 Common.

PLAIN WHITE OAK

2	cars	4/4″	Fas.
2	"	5/4″	No. 1 Com. & Btr.
3	"	4/4″	No. 1 Com. & Sel.
3	"	4/4″	No. 2 Common.

QUARTERED RED OAK

3	cars	4/4″	Fas.
6	"	4/4″	No. 1 Common.
2	"	4/4″	No. 2 Common.

PLAIN RED OAK

2	cars	4/4″	Fas.
3	"	5/4″	Fas.
3	"	6/4″	Fas.
2	"	8/4″	Fas.
8	"	4/4″	No. 1 Common.
2	"	5/4″	No. 1 Common.
2	"	6/4″	No. 1 Common.

QUARTERED RED GUM

2	cars	4/4″	Fas.
2	"	4/4″	Fas. Fig.
2	"	5/4″	Fas.
2	"	6/4″	Fas.
10	"	4/4″	No. 1 Common.
2	"	5/4″	No. 1 Common.
2	"	6/4″	No. 1 Common.

QUARTERED RED GUM S.N.D.

5	cars	5/4″	No. 1 Com. & Btr.
5	"	6/4″	No. 1 Com. & Btr.
10	"	8/4″	No. 1 Com. & Btr.

ASH

4	cars	10/4″	No 1 Com. & Btr.
2	"	12/4″	No. 1 Com. & Btr.
1	"	6/4″	No. 1 Com. & Btr.
2	"	4/4″	No. 1 Common.
2	"	4/4″	No. 2 Common.
2	"	5/4″	No. 1 Com. & Btr.

SAP GUM

8	cars	4/4″	Fas.
3	"	5/4″	Fas.
3	"	6/4″	Fas.
15	"	4/4″	No. 1 Common.
8	"	4/4″	No. 2 Common.
5	"	5/4″	No. 1 Common.
5	"	6/4″	No. 1 Common.

COTTONWOOD

2	cars	4/4″	Fas.
6	"	4/4″	No. 1 Common.
3	"	4/4″	No. 2 Common.

ELM

2	cars	4/4″	Log Run.
2	"	5/4″	Log Run.
1	"	8/4″	Log Run.
6	"	10/4″	Log Run.
6	"	12/4″	Log Run.

Charles O. Maus Lumber Co.

South Bend, Ind., U.S.A.

Southern & Northern Hardwoods

Red Gum
(plain or quartered)
Sap Gum
(plain or quartered)
Oak
(plain or quarter cut)
Ash
Maple
Birch

Southern Elm
Cottonwood
Cypress
Tupelo
Poplar
Walnut
Mahogany

When you think of lumber, think of us.

High Grades Service

"We wish you all a Merry Christmas and a Prosperous New Year"

La Tuque Turpentine

Made by an improved laboratory process from Canadian woods.

An excellent thinner for paste, colors, enamels, stains, paints and varnishes.

La Tuque Turpentine contains no free rosin.

The quality is there
The price is right

Write us for particulars

BROWN CORPORATION
56 St. Peter St., QUEBEC, P.Q.

What would Robinson Crusoe have done without his man Friday?

Won't you let us be your man Friday when it comes to taking care of your lumber requirements? We have a complete stock on our yard and keep in touch with saw mills with unlimited stocks.

Send us your inquiries for straight or mixed cars

R. R. May Hardwood Co.

1522 S. Sixth St. Louisville, Ky.

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Ply Wood Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Never Before

have we been so well fitted to give the trade such prompt and careful service and such compelling values. We feel sure that on our first order we can please you in a way that will make you one of our permanent customers.

Will you remember us the next time you are in need of Gum, Poplar or Oak?

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY

Memphis - Tennessee

SERVICE

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

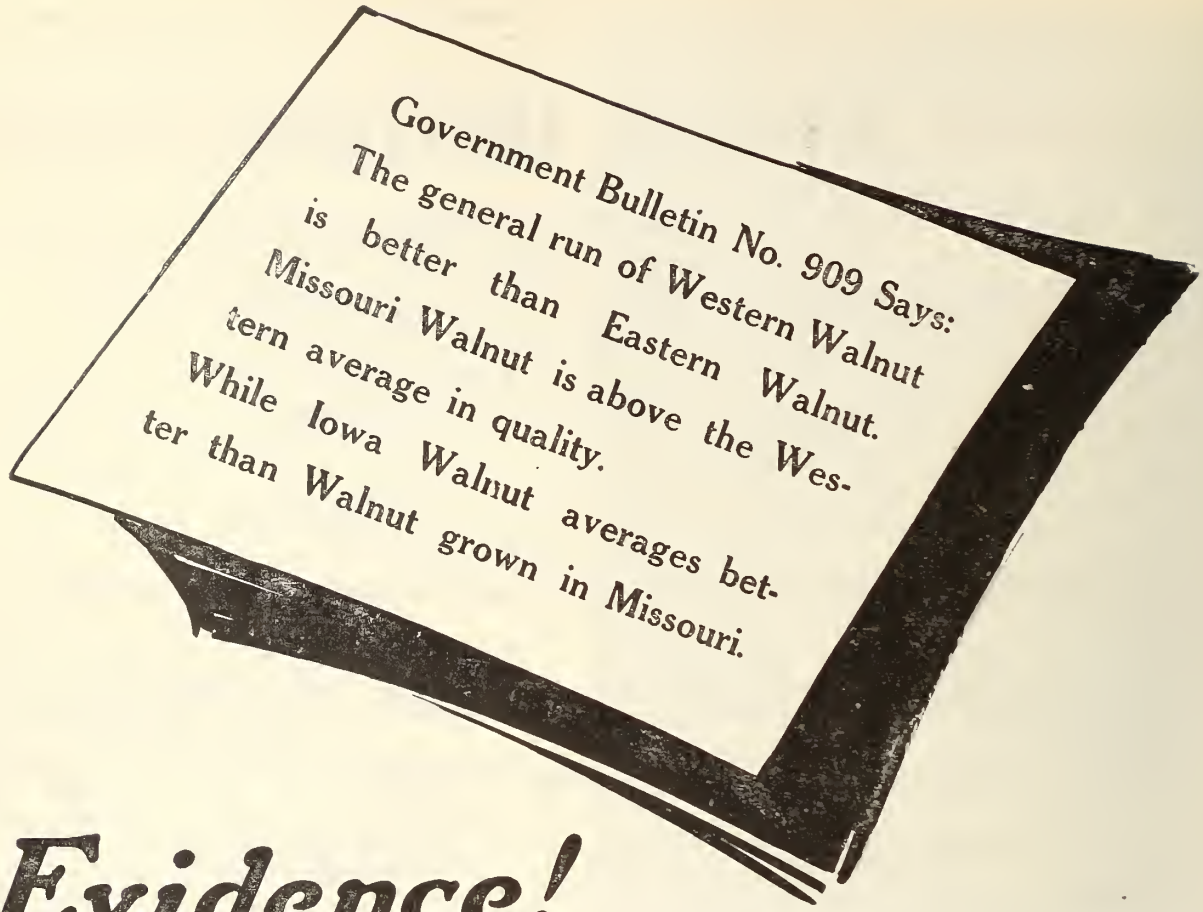
Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO


Government Bulletin No. 909 Says:
The general run of Western Walnut
is better than Eastern Walnut.
Missouri Walnut is above the Wes-
tern average in quality.
While Iowa Walnut averages bet-
ter than Walnut grown in Missouri.

Evidence!

During the War the government department of agriculture made a careful investigation of Walnut production in the United States. The extracts above are from this report.

Evidence, is it not, of a very convincing sort, of the quality of **Iowa Walnut**? The Iowa fields have not been cut over. The trees grow mainly in the fertile river valleys on the same soil that produces the famous Iowa Corn.

Nature has favored this product so lavishly that it is small wonder so many of America's leading furniture and cabinet makers choose Iowa Walnut for the pieces in which they take particular pride.

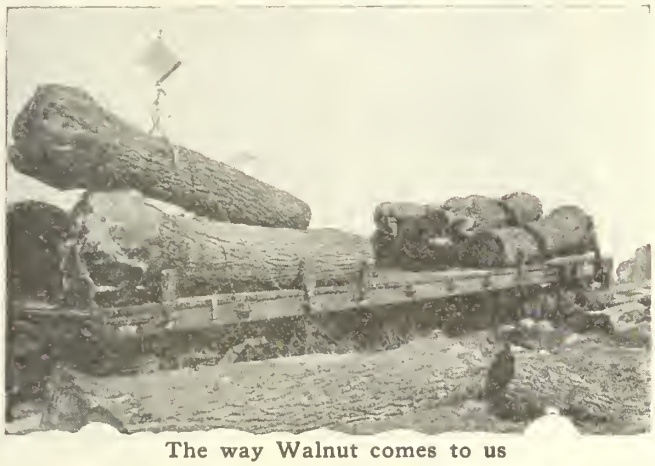
Write or Wire

Write or wire for prices on your needs. You'll find Iowa Walnut no higher than you pay for ordinary Walnut.

Des Moines Sawmill Company
1024 Murphy St., Des Moines, Iowa

IOWA Walnut

"Hartzell's Choice Walnut"



The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

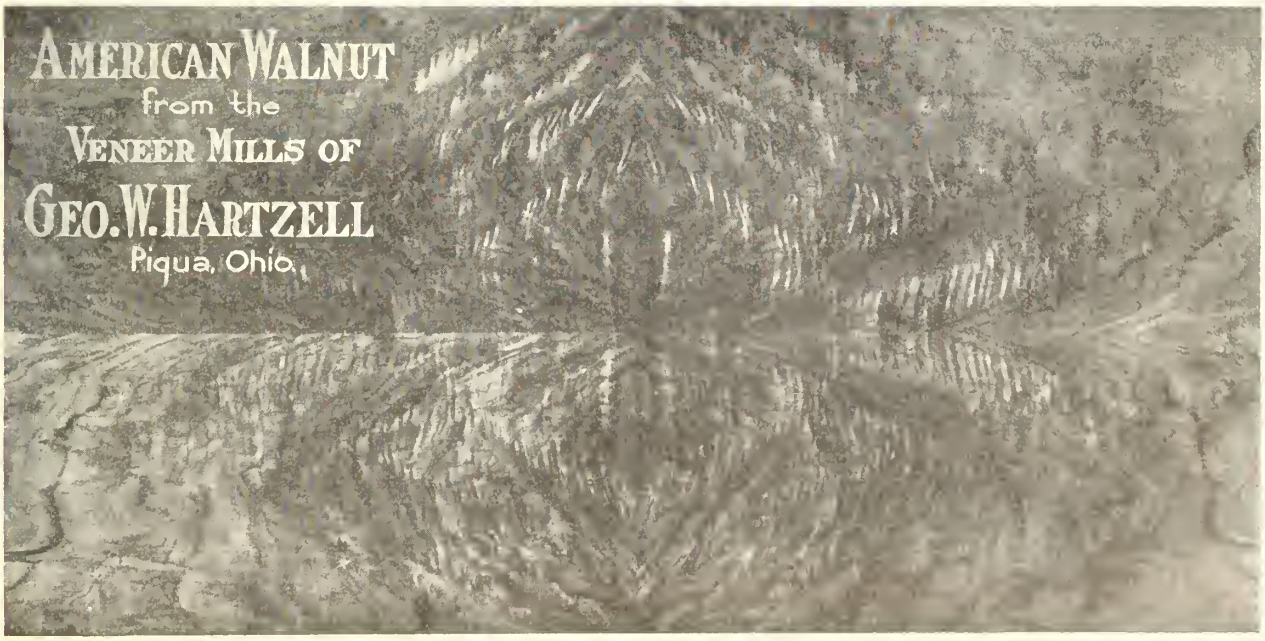
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

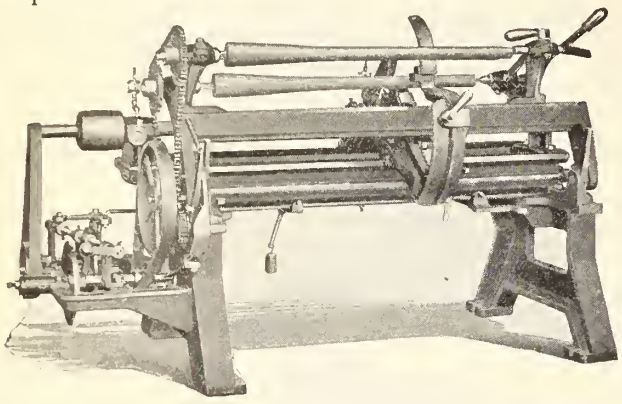
Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

MAKE MORE MONEY

from your timber by working it into handles and other turned work. Short and crooked logs, small trees, and other waste material can be worked at a profit.



OBER machines will help you.
We build Turning Lathes, Sanders, Rip Saws, Bolters, Boring and Chucking machines, etc.

SIMPLE, STRONG, DURABLE

Write for free catalogue No. 31.

The Ober Mfg. Co.

Chagrin Falls, O., U.S.A.

CLAMP NAILS DO IT

The Cabinet Maker

Internationally known and universally adopted by the leading cabinet makers as the most practical and economical method of mitred joinery.

Samples and circulars on request.

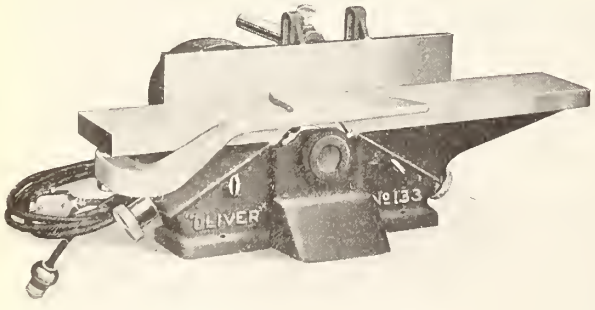
CLAMP NAIL COMPANY

4532 Palmer St. CHICAGO, U.S.A.

LOOK!

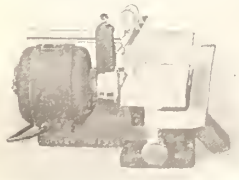
An "Oliver" Portable

Hand Planer and Jointer



Attach to Any Lamp Socket

This "Oliver" No. 133 Portable Hand Planer and Jointer is built in 2 sizes, 4-in and 6-in. It is made for motor or belt drive.



This machine will do more jointing and planing in 30 minutes than you can do by hand all day and do it better.

Circular?

Direct Motor Drive

OLIVER MACHINERY CO.

Grand Rapids, Mich., U.S.A.

¶ The advertisements of the leading manufacturers will bring you into touch with trade conditions and the better qualities of engineering products.

Hugh C. MacLean Publications

Contract Record & Engineering Review, Electrical News, Western Canada Coal Review, Canada Lumberman & Woodworker, Western Lumberman, and also Canadian Woodworker & Furniture Manufacturer, Footwear in Canada and the Commercial. MacLean Building Reports give advance information on all building, engineering and construction in Canada.

TORONTO
MONTREAL
NEW YORK
LONDON

PUBLISHING HOUSE OF HUGH C. MacLEAN

WINNIPEG
VANCOUVER
CHICAGO
ENGLAND

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

Steele & Hibbard Lumber Co.
ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

We Wish You

A Merry Christmas and A Prosperous New Year

WE are sure you will enjoy a Good Business Year in 1923. Good business will be the result of good merchandise. American Plywood Panels are unexcelled in Quality and Workmanship. Let the stock prove our contention by sending us a trial order.

AMERICAN PLYWOOD CORPORATION
New London, Wisconsin, U.S.A.

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE, LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

BEDNA YOUNG'S
SOUTHERN HARDWOODS

The quality and saleability of your furniture depends primarily upon your selection of hardwoods, for without good material the finest craftsmen are helpless. Play safe—always choose Bedna Young's hardwoods. Fine, figured, quartered oak a specialty.

BEDNA YOUNG LUMBER CO.,
Jackson, Tennessee

HARDWOOD PRODUCTS AND LUMBER

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

J. V. STIMSON & COMPANY

We offer an unsurpassed service in any of the above woods—straight or mixed carloads. We specialize in soft textured, finely figured, quarterly-sawn red and white oak. Try it.

OWENSBORO - KENTUCKY

Bandmills: Owensboro; Campbellsville, Kentucky

Mercereau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern
HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

Table Slides Table Slides Table Slides

You have tried the rest, now use the best.

WATERTOWN TABLE - SLIDE COMPANY

Watertown, Wisconsin, U.S.A.

AMERICAN BLACK WALNUT

LUMBER **VENEERS**

OUR SPECIALTY

A goodly supply of choice stock on hand at all times.

BAND MILL IN DAILY OPERATION

It will be a pleasure to figure on your requirements. With the growing demand and the increasing popularity of Black Walnut, you, naturally wish to be prepared to meet this demand. Our suggestion is that you cover your needs early.

1 28″ SLICED WALNUT VENEERS

especially selected for quality wood and color.

LET US HAVE YOUR INQUIRIES

The Kosse, Shoe and Schleyer Co.

Lock Box No. 18 St. Bernard, Cincinnati, Ohio.

Agents in all Furniture Centres.
Branch Office: Grand Rapids, Mich.
Represented in Chicago, Rockford, Ill., Detroit, Kitchener, Ont., Canada, Utica, N.Y. New York City and San Francisco

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated General Office, NEW ORLEANS, U.S.A

1" to 4 No. 1" Common and 1s & 2s **HARD MAPLE**
Excellent widths and lengths.
Can kiln dry and surface.
G. Elias & Bro., Inc. Elk Street to the Buffalo River **Buffalo, N. Y.**

MILLER, STURM & MILLER
Hardwoods of All Kinds
1142 Seneca Street

Taylor & Crate **Hardwoods of All Kinds**
A stock of 18,000,000 to 20,000,000 ft. of Hardwoods carried at all times at our big Buffalo yards.
RAIL AND CARGO SHIPMENTS
Established 56 Years **2101 Elmwood Avenue**

Buffalo Hardwood Lumber Co. J. B. Wall, Pres't
M. M. Wall, Treas.
T. H. Wall, V-Pres't.
940 Seneca Street
We specialize in—WHITE ASH, OAK AND MAPLE

ATLANTIC LUMBER COMPANY
HARDWOODS
Our Specialty—West Virginia and Pennsylvania Cherry
West Virginia Soft Red and White Oak. 1055 Seneca Street

T. SULLIVAN & COMPANY
NORTHERN
Gray Elm and Brown Ash
Niagara Street Corner Arthur

BUFFALO *"Buy and Sell Hardwoods in this Market."*
FAMOUS LUMBER CENTER
Unequalled facilities for rapid dispatch, by Rail, Lake or Barge Canal, on all your requirements, large or small.
SUPPLYING THE HARDWOOD NEEDS OF THE NATION

YEAGER LUMBER CO., INC.
Our Specialities
Oak Poplar Ash Maple
932 Elk Street

STANDARD HARDWOOD LUMBER CO.
Hardwoods
Prompt Shipments—from Buffalo Yards or from Mill direct to you
8,000,000 feet Dry Stock on Hand. 1333 Clinton Street

HUGH McLEAN LUMBER CO.
HARDWOODS OF ALL KINDS
Our Specialties—Quartered White Oak, Plain and Quartered Gum
940 Elk Street

BLAKESLEE, PERRIN & DARLING
A complete stock of seasoned Hardwoods
Including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

FRANK T. SULLIVAN
Specialties
Cherry, Walnut and Pacific Coast Woods
Main Office: 600 Ellicott Square. Yard: 2598 Delaware Ave.

During November—

entirely unsolicited, we received orders from our clientele for over 200 cars of Canadian Hardwoods. This surely proves our service satisfies.

We can handle your requirements in Canadian Hardwoods to your satisfaction.

Send us that enquiry now.

PEDWELL Since 1883 Service to Hardwood Users

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVENUE - - - TORONTO

Glimpse number one—
into the southern hardwood operations of

E. SONDHEIMER CO.

(Cable Address: Sonderco, Memphis)

Manufacturers and Exporters Famous Tensas Basin Red Gum

VIRGIN FOREST RED GUM AND OTHER NATIVE HARDWOODS SONDHEIMER, LA

Manufacturers and Exporters Genuine Louisiana Red Cypress

Band Mills:
Tallulah, Alexandria and Sondheimer, La.

Office and Yard:
Memphis, Tenn.
Chelsea and McLean Avenues

Produced by St. Lawrence Furniture Company

For Furniture of simple design you naturally select Birch

BIRCH supplies that touch of the exquisite, the colorful, that at once transforms the merely pleasing into an object of rare charm and compelling interest. We have an example of this in the piece of furniture shown above.

Pleasing as this design undoubtedly is, its real charm lies in the depth and tone of the material used in its construction. The manufacturer—who is noted for his keen sense of the selling value of materials—has rightly chosen the premier Canadian hardwood, and the result is—success.

There are many other manufacturers who could use more Birch to the same advantage. Are you one of them?

We extend to our customers and the trade in general our best wishes for a Merry Christmas and a Happy, Prosperous, and Successful New Year.

Yours for 1923

Specialty E C & S *Birch*

Edward Clark & Sons Limited

807 Bank of Hamilton Building **Toronto, Canada**

EFFICIENCY *COURTESY* *SERVICE*

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

FIBRO-KANE
PATENTED
OPEN WEBBING

NATIONAL PATENT REED
SALES COMPANY
DREXEL BUILDING
PHILADELPHIA, PA.

Hardwood Dowels
Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co.
LIMITED
Orillia, Ontario
Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

Ash Poplar Cypress

HAFNER
MANUFACTURING COMPANY

We can Ship promptly from St. Louis practically all items of Oak, Poplar, Gum, Cypress.

ST. LOUIS, MO., U.S.A.
ESTABLISHED 1871

Oak Red Gum

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods
White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES—that you can afford to pay
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

Mills: Coal Grove, Ohio

CANADIAN ENQUIRIES SOLICITED

General Offices: 33 Rector St. New York City

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENNESSEE SCENTED CEDAR

1 in.—29,000
1¼ in.— 2,500

CHERRY

	1 & 2	Strips Clear	Com No. 1	Com No. 2
1 in.	32,500	8,200	181,900	213,000
1¼ in.	23,500	200	22,600	17,500
1½ in.	8,200	.....	33,700	88,300
2 in.	7,000	.....	28,200	68,900
2½ in.	5,500	.....	4,300	2,200
3 in.	22,700	.....	6,500	5,300
4 in.	4,900	.....	900	400

CHESTNUT

	1 & 2	Clear Strips	No. 1 Com	No. 2 Com
¾ in.	1,500	.....	2,000	.....
1 in.	69,000	4,500	105,000	6,000
1¼ in.	7,800	100	17,200	33,200
1½ in.	14,500	1,600	75,000	62,300
2 in.	14,200	.....	22,300	29,200
2½ in.	3,000	.....	400	.....
3 in.	1,300	.....	300	500
4 in.	1,500	.....	300	.....

PLAIN RED OAK

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
¾ in.	88,000	224,000	31,800	11,500
⅝ in.	.....	74,000	21,600	2,000
1 in.	66,200	23,000	9,400	50,000
1¼ in.	22,700	15,600	400	1,100
1½ in.	36,900	19,200	700	.....
2 in.	46,500	121,000	26,000	5,000
2¼ in.	1,500	1,400	.....	.....
2½ in.	94,100	33,000	.....	.....
3 in.	5,800	20,500	7,000	12,000
4 in.	2,600	4,900	.....	.....

PLAIN WHITE OAK

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
⅝ in.	.....	7,000	16,900	9,000
¾ in.	125,800	271,000	86,000	38,000
1 in.	61,300	33,000	16,200	105,000
1¼ in.	26,700	1,000	.....	.....
1½ in.	29,300	33,000	.....	.....
2 in.	16,000	60,000	7,000	6,500
2½ in.	118,800	47,500	2,000	1,800
3 in.	18,800	42,800	2,400	600
3½ in.	4,500	5,000	.....	.....
4 in.	27,000	20,500	.....	.....

QUARTERED RED OAK

	1 & 2	Clear Strips	No. 1 Com	No. 2 Com
¾ in.	1,700	.....	5,700	500
1 in.	6,200	5,400	2,500	1,400
1¼ in.	5,900	.....	900	.....
1½ in.	.....	.....	.....	.....
2 in.	.....	.....	7,400	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips	No. 1 Com	No. 2 Com
½ in.	6,100	.....	.....	.....
¾ in.	3,900	.....	5,600	3,000
⅝ in.	2,800	.....	700	800
1 in.	35,300	300	2,400	200
1¼ in.	600	4,300	2,000	200
1½ in.	8,000	500	3,500	.....
2 in.	2,000	.....	24,100	5,700
2½ in.	1,000	.....	400	.....
3 in.	1,800	.....	700	.....
4 in.	2,500	.....	1,700	.....

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	.....	1,800	.....
5/4	14,000	.....	.....
8/4	15,500	.....	.....
10/4	10,250	15,000	1,800
12/4	3,500	4,000	300

PLAIN RED GUM

	1 & 2	No. 1 Com.	No. 2 Com.
1 in.	50,200	31,900	600
1¼ in.	23,000	11,325	400
1½ in.	27,000	61,300	15,500
2 in.	4,000	300	.....

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	18,000	64,000	.....
5/4	18,400	9,800	200
6/4	29,900	50,500	5,600
8/4	44,300	.....	12,000
10/4	2,000	3,000	.....

SAP GUM

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
1 in.	.....	400	.....	.....
1¼ in.	1,400	15,200	2,000	9,000
1½ in.	.....	1,800	13,500	2,500
2 in.	5,100	2,400	.....	18,800
3 in.	.....	.....	.....	300

POPLAR

	Stained Saps	No. 1 Com.	No. 2 Com.	No. 3 Com.
¾ in.	.....	9,000	.....	.....
⅝ in.	4,000	10,300	1,800	.....
1 in.	19,000	84,900	7,800	.....
1¼ in.	6,000	30,700	5,000	.....
1½ in.	15,700	19,000	22,500	8,000
2 in.	20,422	9,400	7,500	.....
2½ in.	4,700	15,800	600	.....
3 in.	5,400	2,900	31,000	9,000
4 in.	2,900	6,300	200	.....

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y.

Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

A Permanent Lumber Service

AFTER several years of inactivity we are now cutting on our modern fully equipped mills at Manistique and Little Lake, Upper Michigan. The timber behind these mills was purchased many years ago by the Stack interests from the then "unlimited" supply. Its quality, particularly the maple and birch, is the envy of northern mill men among whom this tract is famous.

This timber will run the mills to full capacity for fifteen to twenty years. The 40,000,000 feet annual cut will run:

15,000,000 ft. maple annually
6,000,000 ft. birch annually
2,500,000 ft. beech annually
2,500,000 ft. elm annually
900,000 ft. basswood annually
200,000 ft. ash annually
3,000,000 ft. white pine annually

the balace in Spruce and Tamarack.

Our exceptional service, grades, and manufacture will be maintained. "Low freight rate shipments by water to Toronto, Montreal, Owen Sound, Port Arthur, and other Great Lakes and St. Lawrence River Ports. Conveniently located also for rail shipments to inland points by the C.P.R. or Soo line."

We will be pleased to hear from old friends and from new ones who can understand and appreciate what permanent connection with such a source of supply would mean.

STACK LUMBER CO.
ESCANABA MICHIGAN

97%

of Furniture and allied lines are sold on the recommendation of the Retail Merchant

In the eyes of the Consumer he is responsible

BANNING

For

Hardwoods

Oak
Ash
Walnut
Mahogany
Poplar
Chestnut
Gum

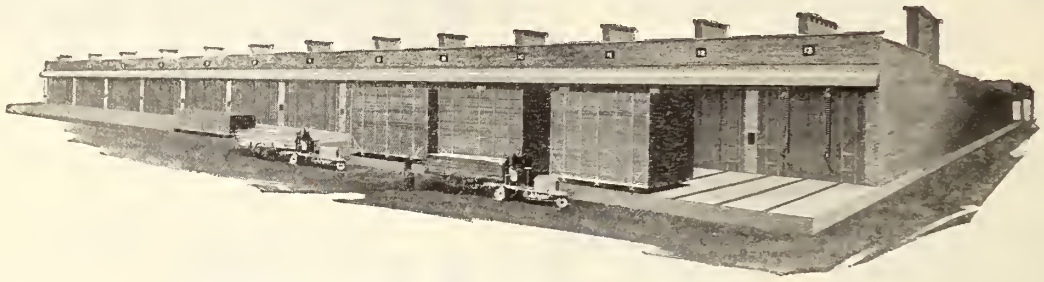
Our Prices and Values are Right

Give us a trial on your next order.

We want you to see our stock.

Canadian Representative
A. E. KLIPPERT
11 Laxton Ave.
Toronto, Ontario

KILN DRIED HARDWOODS



Kiln capacity 3,000,000 ft. monthly

WEST VIRGINIA
OAK
CHESTNUT
WHITEWOOD
BIRCH
HICKORY

We earnestly solicit your inquiries

AROMATIC RED CEDAR

ARKANSAS
RED GUM
SAP GUM
OAK
ASH
ELM

The M. B. Farrin Lumber Co.

CINCINNATI, OHIO

Dependable Shippers of American Hardwoods

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars

All Canadian and American Hardwoods
Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - - TORONTO

Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.

Subscription, Canada, Great Britain and British Possessions $2.00; United States $2.50; other Foreign Countries $2.00. Single Copies 15 Cents.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 22 **Toronto, December, 1922** **No. 12**

The Deciding Factor

The question of the wages paid in the woodworking industry is usually a fruitful source of discussion whenever the subject is mentoined. Those who have given the matter more than a passing thought and who have taken the trouble to compare the rates paid with those prevailing in other fields are usually quite willing to admit that woodworking wages do not compare at all favorably. That is about as far as they are able to go, for with the low level of values established for wood products and with the keen and at all times unenlightened competition which prevails, it is extremely difficult to see how higher wages could be paid without ruining a vast majority of the woodworking establishments. It seems to be a kind of an impasse where the employers in the woodworking industry would like to give their men more money but can't.

In view of this, the suggestion that it is not what is paid but what is produced that counts may open up a new line of thought. At a very low rate of production twenty cents an hour might be away too much, while for the same class of work and under identical conditions but with a much higher rate of production, one dollar an hour might be too low and a higher rate could well be paid. This would seem to place a different aspect on this question of wages and might even be said to contain a hint that to a certain extent the employers themselves may not be entirely free from responsibility for present wage levels in their industry. However, most of the blame, if blame there be, must rest on the shoulders of the executives for to a large extent the productiveness of the plant as a unit, and of each individual operation, depends on the way the plant is equipped and organized and upon the spirit of co-operation which has been engendered between employers and men.

There is a limit to what can be produced so there must be a limit to what can be paid, but has the limit of productiveness been reached in the average woodworking plant. It is said, based upon results secured in many plants, that a method of paying for what is produced at rates that are accurate and which bear a relation to maximum output, usually results in a marked increase in output. When the rates or standards are developed in an intelligent manner and upon an accurate permanent basis, such a method is extremely fair to all concerned.

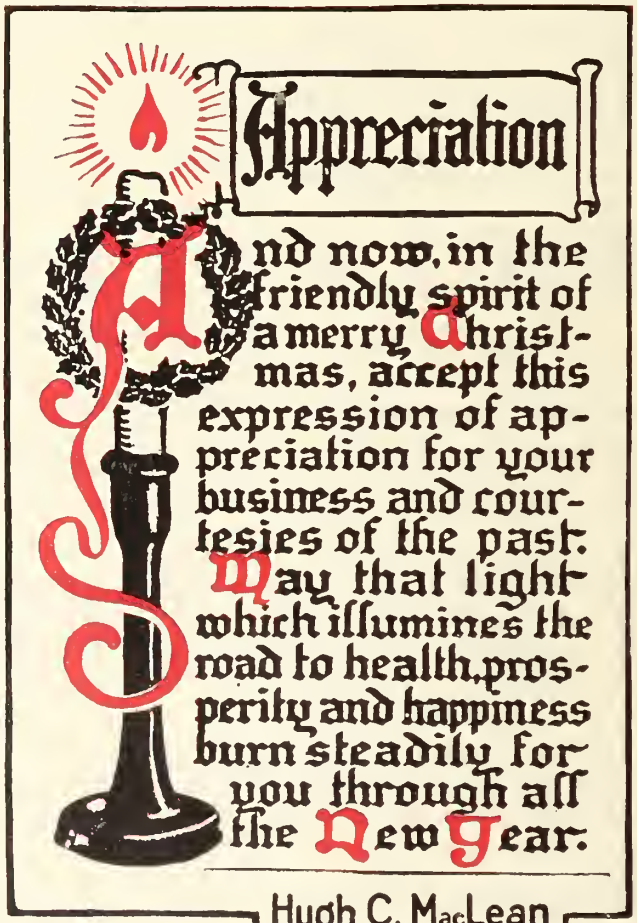
Elsewhere in this issue are given a few illustrations of what has been achieved in several plants in the direction of increased output. These would seem to indicate that there is plenty of scope for improving the productiveness of the average woodworking factory. With such increases in output and corresponding decreases in costs possible, there would seem to be no logical reason why proper planning and proper co-operation, a wage much better than that which is paid at present should prevail. In one of the instances to which reference is made, a workman increased his earnings forty-eight per cent. This in itself would seem to indicate what can be accomplished through an incentive plan developed on a proper basis.

Looking at the question of wage levels and productiveness in this light, it would appear as if everyone from the manager down to the humblest employee should be interested in increasing the ratio of production and thus making higher earnings possible. Yet, often, when an attempt is made to apply a plan of this kind, the very employees who stand to gain are the ones who resist and condemn such an installation. While a number of reasons might be assigned for this attitude, nevertheless it is a very short-sighted one, for regardless of how they are paid, their earnings must bear some relation to what they produce, only under an incentive plan they benefit directly in proportion to the extra effort put forth

This idea should provide food for thought on the part of both employer and employee. If opportunities for materially increasing production exist in every woodworking plant, and there is no doubt but that they do, all concerned are vitally interested in leaving no stone unturned to secure maximum output from each operation for all stand to benefit.

Saying you can do a thing isn't self-confidence—it's knowing you can do it.

Business is like a wheelbarrow—it stands still unless someone pushes it.


Appreciation
And now, in the friendly spirit of a merry christmas, accept this expression of appreciation for your business and courtesies of the past. May that light which illumines the road to health, prosperity and happiness burn steadily for you through all the New Year.
Hugh C. MacLean
Publications

Reducing Costs in Crate Construction

The Firm That Makes a Study of its Packing Requirements will be Able to Effect Important Economies in its Shipping Department—Properly Designed Crates Correctly Constructed from the Right Kind of Lumber will Save Money

By Albert W. Luhrs*

It is obvious to any one making even a cursory examination that in many furniture plants the method of packing and crating shipments have, like Topsy, just growed. In many instances the foreman in charge of the packing room has held the same position for so many years that he believes there is nothing more for him to learn about crating, and all too many plant superintendents are in accord with him. Consequently, even though improvements are continually being made in woodworking methods, in the handling of material, and in practically all other departments of the plant, nevertheless the crating continues the same as it has been for many years. With what result, do you ask? Why, with the result that factories with carefully studied systems of packing and crating based on research, tests and engineering principles are producing a container for their shipments that is frequently much lighter and less costly than the packing used by many of their competitors for the same article. Yet that is not all, because another important benefit of such a study is the fact that the shipments, if shipped in properly designed containers, usually reach the consignee in good condition. This of course, means more prompt payment of invoices, greater turnover for the retailer with a consequent increase in the manufacturer's output, and the good will of the trade—one of the manufacturer's most valued possessions and which all are striving to obtain.

Fig. 1—A typical crate made from waste lumber

Crating Lumber

Let us discuss the question of costs; first, in connection with crating lumber. On this point different plants have radically different ideas which run from the one extreme of buying crating lumber cut to size S2S, to the other extreme of buying what practically amounts to saw-mill refuse, knotty, waney, barky lumber, or rotted, tongue-and-groove, reject flooring. As a general rule, furniture shippers of either class are losing money, the only possible exception being where a plant produces large quantities of one product and buys its crating lumber cut to size, but even in such a case it is usually advisable to use a type of container other than a wooden crate, such as, for example, a wirebound box or crate, or a veneer panel box, or a strawboard or fibreboard box, the one to be used obviously depending on the article being shipped.

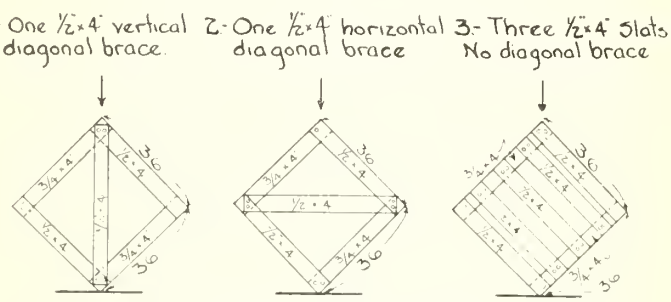


Fig. 2—Boxes with diagonal braces are stronger than those with cross slats as shown in Fig. 4

Most furniture manufacturers purchase lumber from a source some distance from their plant and as a general rule the freight charges on the lumber exceed the actual cost of the lumber. For this reason, a 30% increase in the cost of the lumber at the source will usually make not more than a 15% increase at the furniture manufacturer's plant. The 30% increase at the source is ample to cover the dif-

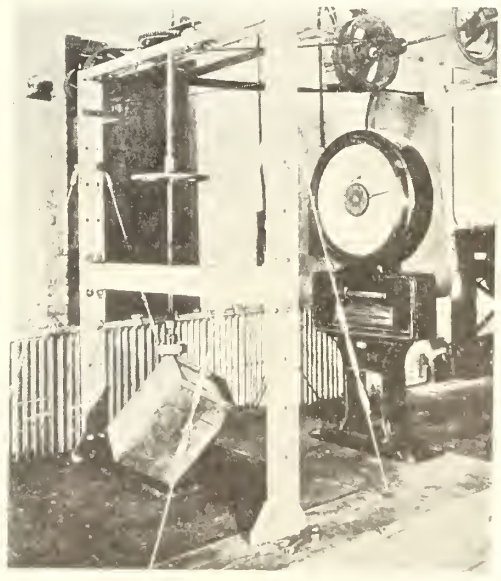


Fig. 3—A machine for the testing of boxes

*Container engineer, Freight Container Bureau, American Railway Association.

ference in cost between a poor grade of crating lumber and a good grade and the question then resolves itself into whether it is advisable and economical for the shipper to buy a good crating lumber and pay an increase of 15%, at his plant, over the cost of a poor crating lumber. The answer is usually yes, for the

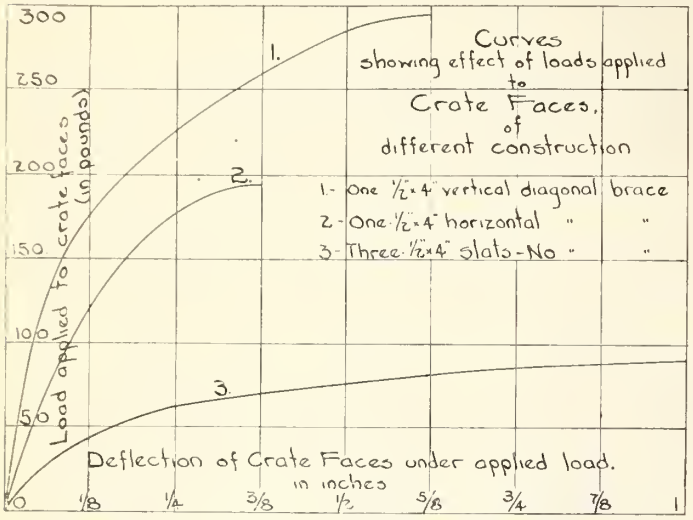


Fig. 4—This curve shows the superiority of diagonal braces

reason that more than the excess cost will generally be gained by a saving of the labor which would be required to saw out the bad defects of the cheap lumber, as well as the fact that where there will probably be a waste of less than 10% in the one case, the waste may frequently run as high as 25% to 30% in the other. In addition the indefinite saving or profit due to the difference in the condition of the furniture on arrival at the consignee is an important item and not to be overlooked.

Somewhat the same line of reasoning applies to the manufacturer who thinks his crating costs him very little because he uses the wastes of his factory. Here, his additional labor in sawing each piece of waste to the proper size and building his crates out of that lumber, almost every piece of which is either of a different width or thickness, is often very much more than what his crating costs should be. A careful examination of costs would probably convince him, as it has others, that a large saving could be effected by using his waste lumber for power generation and constructing standardized crates of lumber purchased for that purpose. Figure 1 shows a typical crate constructed by a company that uses its waste lumber for crating purposes.

Should Light or Heavy Crating Lumber be Used?

Should a heavy or light wood be used for crating? The answer to that question depends both on the difference in cost of the woods, their relative weights, and whether the shipper or consignee pays the freight either directly or indirectly. This matter is one of far greater importance than would be indicated by the little time spent on a consideration of it by most shippers. As an illustration let us assume the following:

Number of shipments per year..	30,000 pieces
Average f.b.m. per crate	18
Average cu. ft. of lumber per crate	1.5
Average freight rate	$1.00 per 100 lbs.
Cost of elm, beech, oak or ash ..	$24 per M.B.M.
Cost of spruce, fir, white pine, or western yellow pine	$32 per M.B.M.
Average weight of elm. beech. oak or ash	42 lbs. per cu. ft.
Average weight of spruce, fir, white pine, or western yellow pine	27 lbs. per cu. ft.
Assumed waste for cutting	10% in each case

Then, in the case of the hard woods, the cost of lumber per year will be:

$$\frac{30{,}000 \times (18+1.8) \times 24}{1000} = \$14{,}256.$$

The cost of freight per year on the lumber in the form of crates will be:

$$\frac{30{,}000 \times 1.5 \times 42 \times \$1.00}{100} = \$18{,}900.$$

Total cost of lumber and freight on lumber will be $33,156.

In the case of the soft woods the cost of lumber per year will be:

$$\frac{30{,}000 \times 18+1.8) \times 32}{1000} = \$19{,}008.$$

The cost of freight per year on the lumber in the form of crates will be:

$$\frac{30{,}000 \times 1.5 \times 27 \times 1.00}{100} = \$12{,}150.$$

The total cost of lumber and the freight on lumber will thus be $31,158.

Or, in the above case, a saving of approximately $2,000 in favor of the lighter woods.

It must be remembered that the above example

Fig. 5 (left)—well constructed crate containing six chairs. Considerable saving could have been made if paper bags had been used instead of excelsior.

Fig. 6 (right)—an example of bad practice. The furniture is liable to be seriously rubbed by the crate members.

is based on assumptions of conditions that vary at every plant and depend on local conditions. If, however, the problem is worked out, using your own figures you can readily determine the advisability of continuing to use the lumber you are now using or changing to a different species. The figures used above for the weights of different species of lumber are for air dried wood or, in other words, wood having a moisture content of from about 12 to 15 per cent.

The Use of Diagonal Braces

The advisability of using diagonal braces is apparent to many shippers, yet there are countless others who, because they do not understand the advantages of a diagonal as against the usual cross slat, still do not use them. A cross slat, or in other words the vertical or horizontal piece of wood nailed to two adjacent and parallel frame members, helps but little towards stiffening the crate, whereas a diagonal brace, or a strip of wood running from one corner to the opposite one, makes a remarkable difference. As an illustration of that, figure 2 shows three frames each with the same outside dimensions and each constructed exactly like the others, except that two had one ½" x 4" strip nailed diagonally across each of them while the other had three ½" x 4" strips nailed across it. These were all placed in a testing machine similar to the one shown in figure 3, and the results as shown in figure 4 were obtained. From figure 4 it can be seen that even though it required considerably fewer nails, less labor and less lumber to construct the frames with the diagonal brace than the frame with the 3 slats, they were from 2 to 3 times as strong as the other. The results obtained can be roughly verified in your own plant merely by nailing up several such frames and by pushing down on one of the corners. The great difference in strength will be readily apparent.

The results of such an experiment should teach us that, if the nature of the contents of the crate allows, many of the cross slats now used in an attempt to stiffen the crate should be done away with and a diagonal used on each face in its place, thereby allowing a considerable saving and yet obtaining a stronger crate.

Run Slats Across Shortest Span

While on the question of cross slats, it might be interesting to point out that if the cross slats were run across the shortest dimension of a face of the crate instead of the long way as is now often done, much thinner lumber might be used with exactly the same protection to the shipment. For example, where a 1" slat on a long span, say 6 feet, would deflect 1" at its center under a certain load, a slat to give the same deflection and consequently the same protection under the same load on a 2-foot span would have to be only ½" thick. The proper thickness of lumber to use for different spans can be calculated by means of the beam flexure formula and curves have been drawn, based on the results of the calculations, which show for any span what thickness of lumber will afford suitable protection to the shipment.

Paper Bags

Figure 5. shows a well constructed crate containing 6 chairs. This shipper could have made a considerable saving on this shipment however, if instead of using the excelsior pads as he has done, he had used paper bags. In this case, where the chairs are suspended in the crate at no point closer than 1" to the crate and the crate is stiffened with diagonal braces so that there is no possibility of the frame members of the crate rubbing against the furniture, of which bad practice figure 6 is an excellent example, the only protection needed is a protection against moisture, dust and dirt. For this purpose a paper bag would have served admirably, in fact, even better than the excelsior pads because of the possibility of the excelsior pads printing on the finished surfaces. And what would be the difference in cost? Here are actual figures from one chair shipper for material only:

Chairs in Excelsior Pads

33 pads	$0.341
3 lbs. newspapers	0.015
¼ lbs. tying-up twine	0.050
	$0.406

Chairs in Paper Bags

6 bags	$0.24
	$0.24

This shows a saving of 16.6 cents for each 6 chairs in packing material alone. The saving in labor

Fig. 7—A chair wrapped in paper bags

will vary greatly in each factory but it can easily be appreciated that it takes far less time to slip a paper bag over a chair than it does to tie on the excelsior pads. It is quite possible that some manufacturers have not previously heard of the use of paper bags for chairs. Briefly, a bag is usually made of a 25 lb. kraft paper, which is cut, folded and pasted together so that when opened it is of such a size as to completely cover one chair. Most chair manufacturers using bags order a few different sizes and it has been found that with those few sizes practically their entire output can be satisfactorily covered. Figure 7 shows a chair covered with such a bag.

Lock or 3-Way Corners

Many shippers are using a lock or 3 way corner but there are still others who are failing to take advantage of it. Figure 8 is a sketch showing one of the 16 ways in which such a corner can be constructed. Its advantages over any other corner lies in the fact that all the nails driven through each

piece of wood are driven into the side grain of another piece, whereas in any other corner construction having but 3 pieces meeting at the corner, some of the nails have to be driven into the end grain of another piece. As nails driven into end grain do not hold nearly as well as nails driven into side grain, the entire crate, if now constructed without lock-corners, can be greatly strengthened by the use of a lock-corner at no increase in cost.

Use of Cement Coated Nails

Figure 9, which practically speaks for itself, shows the results of tests made on the holding power of cement coated, smooth and barbed nails. I need only add that a cement coated nail holds from 20 to 60 per cent. more than a smooth or barbed nail and that its costs 15 per cent. less.

Possible Saving in Labor

As a general rule, crates are not constructed in an efficient manner insofar as the productivity of labor is concerned. In many factories the crating lumber is piled in the shipping room, not even cut to size. The articles to be crated are then set out on the floor and while one man cuts the lumber to size and another distributes the pieces, several other men each start work at one article and stay there until it is completely crated after which they truck it to the warehouse or platform and then start on another crate. At other plants the lumber is cut to size and several of the pieces are nailed together on a table. These are then distributed to the men, and the same procedure followed as before. At still other plants, whole ends, fronts and tops are nailed together, on a simply constructed frame for ease and speed in nailing, and the crate is then quickly set up around

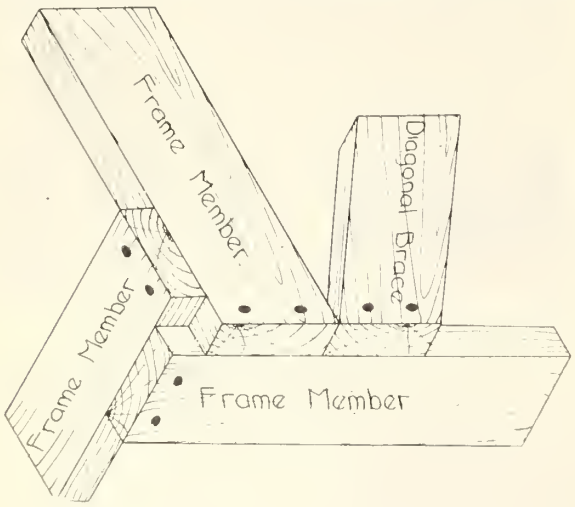


Fig. 8—Three-way crate corner with diagonal brace

the article and nailed together by several groups of men, each of which continually performs the same operation.

In the construction of crates as with almost any other article produced, efficient methods of manufacture should be used. Just what system should be employed at each plant depends wholly on conditions which will vary at different plants, and for that reason, no set of rules can be laid down that will apply equally well at all places.

It might be interesting to point out in this connection that on an investigation of a group of manufactures, each of whom manufactured and crated a very similar product the cost of labor for constructing the crates varied from 14 cents to 43 cents depending entirely on the method of manufacture of the crate, all other conditions being otherwise almost exactly the same.

The Value of a Study of the Crating Department

Because of the possible saving of money in labor and material and the considerable reduction of

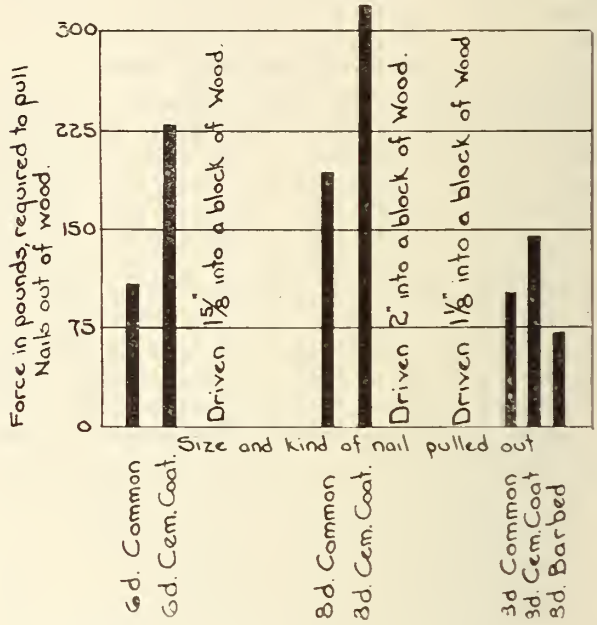


Fig. 9—Relation between holding power of common, barbed and cement coated nails

damages to shipments that may be effected along the lines brought out in this rather brief and incomplete article on the subject, it is the writer's opinion that it would be worth while for the managers of those plants who are not quite sure that their crating and shipping costs are as low as possible to either conduct, or have conducted for them by a competent engineer, a complete study of their packing activities.

The Death of Wm. Cowan

Many friends in the trade will learn with regret of the death which occurred on December 3 of Wm. Cowan, president of Cowan & Co., Galt, Ont., widely-known manufacturers of woodworking machinery. The late Mr. Cowan was in his 82nd year and although he was at his desk in his office until three weeks before his death, he had been in poor health for several months. His passing removes one of the foremost men in the industry and the organization which he directed for the past thirty years has contributed much towards the advancement of the woodworking industry in Canada. Mr. Cowan was originally a veterinary surgeon, being one of the deans of this profession in Canada. He practiced in Galt until 1881 and then became Dominion live stock inspector. His activities with the firm of Cowan & Company commenced in 1891, when he succeeded his brother as head of the company. He was always prominently connected with the affairs of the city in which he lived.

Storage economy is exceptionally important, not only in producing efficiency in the manufacturing department, but in handling raw materials and the finished products in warehouses and stock rooms.

Saving $9.19 a Day on a $4.00 Man

How Productiveness of Woodworking Plants Can be Materially Increased by Proper Organization and the Application of Practical Efficiency Principles —Costs Reduced Without Radical Change in Plant

By W. R. L.

How productive are present day woodworking methods? One often hears suggestions to the effect that productiveness of the various operations as performed in most woodworking plants is not more than half what it should be. In other words, the wood-using industry averages about fifty per cent efficient. Just why this thought should find expression is not quite clear, for the average owner of a woodworking plant feels secure in his belief that the output of his factory is just about all that could be expected. The other fellow may be falling down when it comes to productiveness and lower costs, but, he is not.

Several things have come to my attention recently which have me wonder if there is not more truth in the above thought than even the most progressive woodworker would admit. It is undoubtedly true that the woodworking industry has not been developed and advanced as rapidly as other industries which might be mentioned. This, in itself, would lead one to the conclusion that there is plenty of scope for improvement with regard to woodworking practice and equipment. And there is, but that does not touch the point I have in mind. If there is anything in the suggestion outlined it means that without making any radical changes in equipment, layout or methods the productiveness of nearly all plants, and this includes yours, can be materially increased, through proper organization and the application of practical common sense ideas, as advocated by industrial engineering organizations versed in woodworking practice.

How Production Was Increased

One enlightening incident I have in mind, and in fact the one that inspired the heading of this article, is a report I came across recently. This was issued by the Forest Products Engineering Co., of Chicago, covering an assembling operation in the plant of a client. The figures presented show, due to increased productiveness and decreased overhead per cabinet, a saving of at least $9.19 a day was effected on a man who earned a daily wage of but $4.00. Assembling 22 cabinets instead of 9 as formerly represents an increase in output of 144 per cent a figure considerably in excess of the fifty per cent suggested. However, this to me is not the most interesting feature of this report, rather it is that this saving may be laid to the door of the plan of basic time standards developed by the organization mentioned and which indicated the correct assembling time for that cabinet. As I see it, assembling times varying from 64 to 108 minutes, have prevailed for years and ordinarily the observed time of 58 minutes would have been accepted as the minimum and as a satisfactory reduction from past performance. Knowing definitely that even 58 minutes was too high and knowing how the minimum standard time of 40 minutes was obtained, it remained but to bring the time down to as near the basic time standard as conditions in that plant

Report on Assembling China Cabinets

Equipment—Case clamp

Operation—Assembling china cabinets.

The summarized average of a number of ordinary time studies indicated that an assembly time standard of 58 minutes would be justifiable. Past performance, taken from cost records, indicated varying times from 64 to 108 minutes per cabinet. Therefore a rate of 58 minutes would be a reduction of 86% from the high time and 10% from the low time.

Basic time standards, however, indicated that, with all allowances included, the assembly time of this cabinet should be only 40 minutes. A detailed comparative analysis clearly indicated that the method of assembling, although it appeared to be very good, could be improved. The result was that a basic time standard of 40 minutes per case was established. The first lot was produced in 30 minutes unit time per case, the second lot in 28 minutes and the third lot in 27 minutes.

Results

Employer's Gain

(Hourly rate, 40 cents.)

1st. Lot

Basic time standard	40 min. per cabinet.
Actual performance	30 min. per cabinet.
Difference	10 min.=33-1/3% in'se pay

2nd Lot

Basic time standard	40 min. per cabinet.
Actual performance	28 min. per cabinet.
Difference	12 min. =43% increase pay

3rd Lot

Basic time standard	40 min. per cabinet.
Actual performance	27 min. per cabinet.
Difference	13 min. =48% increase pay

Employee's Gain

Lowest previous time 64 min. per cabinet
Basic time standard 40 min. per cabinet
Difference 24 min. or 38%

Lowest previous unit cost 64 min. at 40 cents per hour=	$.43
Basic time standard cost 40 min. at 40 cents per hour=	.266
Difference	.164

or 39% reduction in cost

Overhead and all burden including executives and other salaries conservatively taken as 100%. Therefore.

Overhead per cabinet	.43
Actual production on basic time standard	22 Cabinets per day.
Best previous production	9 cabinets per day.
Difference	13 cabinets per day.
Unit burden	.43 x 13=$5.59
Reduction in assembling cost	16.4 x 22= 3.60
Estimated unit profit	??? x 13= ??
Total gain	$9.19

per day plus profit on assembling the 13 additional cabinets.

(Showing how production was increased from nine to twenty-two cabinets a day).

permitted. That this time was done is indicated by the report.

Another instance which illustrates the possibilities which are to be found in every plant for effecting cost reduction is that of a furniture factory which ordinarily employed thirty five men in its assembling department. Incentive rates were developed, based on conditions in the plant and upon basic time standards. The resultant increase in productiveness was such that eleven men were transferred from this to other departments and the total output of the department was twenty-five per cent higher than formerly or a total increase of 83% per man. Again in excess of the suggested fifty per cent.

Are Your Costs Low Enough

An eastern furniture manufacturer is saving $20,000 a year in overhead and labor costs on one item of his line. Still another—but why go on. Numerous other illustrations could be given but I think I have outlined sufficient to carry my point. What has been accomplished in certain plants can certainly be repeated in others. There is nothing illogical or unreasonable about such a suggestion. That being the case, how do your production costs line up? Are they about the same as others you know or are they so far below the average that you can undersell your competitor and still make a satisfactory profit.

It does not do much good to meditate on the past and to calculate how much could have been made or saved if ten years ago you could have brought your cost into line with what the above illustrations indicate they should have been. We are more concerned with the present and the immediate future. With such reductions in the average woodworking operation times or cost possible, are you going to be content to let things slide along in the same old groove or are you going to try and reduce your labor costs and make all the money you can?

Do You Know How to Take Off Quantities?

Quantity Surveying is as Important a Subject to the Millwork Man as Costs—Lack of Knowledge on the Matter is Causing Firms to Lose Money Unnecessarily

By H. T. Didesch*

All of you have listened to, and read so much on the subject of "Cost" that is would seem the subject had been utterly exhausted. There is, however, another pregnant subject—one so closely allied with cost as to be virtually a part of it, and one which, unlike cost, has not been expounded in any standard writings and is therefore all the more worthy of deliberate consideration. That subject is "Quantity Survey."

The surveying of millwork quantities from architects' plans and specifications is a matter that has been just as much misunderstood or ignored as has the subject of cost. Of course, the quite general failure of architects to detail fully or specify clearly just what is wanted does not contribute anything to a better performance of the quantity survey. That particular trouble, however, is your own fault, and it will continue to exist just as long as you tolerate it. Now, it may be questioned whether all men are born equal, but there is no denying that all humanity—even millmen and their estimators—is possessed of an intellect which will discover practical methods of overcoming the architects' shortcomings in respect to vagueness and the like. How?

Refuse to Figure When There is No Information

In aggravated instances, refuse to figure the job until specific information is forthcoming. Where the lack of information does not involve a major portion of the job, figure what is apparently appropriate to the character of building under consideration, and state the condition of your proposal, that if subsequent details of information should involve a more elaborate construction than that figured, an excess charge will apply, or, if it is so merited, a proper credit will be allowed. The form of proposal, therefore, is most important, but consideration of it will be deferred until later.

Our industry is slowly but surely emerging from a status of apathy, but if the progress is to continue, there must, for one thing, be just as intensive a study of quality survey and the related proposal and contract, as there is of cost, because what does it avail us to know and apply costs until we're "blue in the face," if, in doing so our estimators misinterpret plans and specifications, leave out an opening here, a course of moulding there, and, what is worse and happens right along, omit a whole floor,

Mr. H. T. Didesch

or through the employment of a doubling-up process, in their hurry to get on the next job, forget to double up and omit entirely a wing of the building. It is indeed a sad thought, but all those things, and then some, are every-day occurrences.

What is Involved in Millwork?

What are you in business for? Not for your

*Technical director, MillworkCost Bureau. This article is based on an address delivered at the annual convention of the Southern Sash, Door and Millwork Manufacturers' Association.

health; otherwise you would indulge in something more delectable than the millwork business. You are trying to make money; perhaps you aspire to great wealth. That money must be made legitimately as manufacturers. Getting sufficient jobs is you first consideration, and that entails competition. Our statutes say, "unrestricted competition;" probably you call it "cut-throat competition." Sometimes it is just that, and entirely deliberate, but, more often, it is nothing of the sort. You produce millwork. What is millwork? I have consulted four recent editions of unabridged dictionary and the Encyclopedia Britannica. So far as our product is concerned, I might just as well have consulted the Koran. Now, if the world's most eminent lexicographers fail to define millwork, how can you expect a contractor, an architect, or a plain man to agree with you as to what constitutes millwork. You do not agree as to its meaning among yourselves to; yet some of you do not hesitate in the least to dictate to your stenographers a letter to a prospective customer: "We agree to furnish the millwork for the John Robinson residence in accordance with plans and specifications prepared by Kenneth & Jordan, architects, for the sum of $5,600.00, f.o.b. Atlanta, Ga." That sort of quotation makes it incumbent upon the seller to furnish everything that the purchaser might demand as millwork. If the purchaser has dealt with a mill whose custom it was to include weights and cords, rough bucks, etc., then he will expect them in this case—whether they were figured or not—and nine times out of ten the will get them, either without any extra charge or on a part charge basis.

Other mills add to the quotation just cited, "as per itemized list attached." On the surface, that form has the aspects of safety, but it is hardly fair to the purchaser, for if he wanted to be certain that the estimate included all millwork, it would be necessary for him to check each quantity from the plans. This particular form of quotation is so manifestly safe to the seller, that most buyers will not buy on that basis. Some buyers refuse to consider such a quotation at all; many will call on the millman and among other things remark: "Your price is all right, but I want to buy this job complete and I am not sure that everything is included in your estimate." The millman expounds a bit over the accuracy of his estimator's list of quantities and finally, to thoroughly convince the buyer of his confidence, writes us an order as follows: "Millwork complete," or simply, "Millwork' John Robinson residence, $5,-600.00." The customer inscribes, "Accepted, Louis R. Carperten." Nothing further, except, of course, certain conventional printing.

A Uniform Agreement

That can hardly be termed "good business" or "legitimate competition." Nothing whatever is said about terms of payment or deliveries; the extent of work is not defined; in fact, the transaction hardly measures up to the standard of simple, economical practice. To demonstrate the point, let me read a letter from one of your members to Secretary Harman, dated September 19, 1922:

"Will you please advise us if you have in your office a form of estimate in which terms of payment are shown and which indicates how, if customers do not live up to agreement as to payment of account and otherwise, the balance of the estimate can be cancelled and action taken against customer immediately for amount due.

"We have at the present time a case in our office of a customer owing a considerable amount of money, who has not lived up to his agreement in the way of payments, yet upon our refusal to continue deliveries on the estimate in question, we are placed upon notice that unless we do so, they will buy in open market for our account. We find that under the law they can compel us to do this, and if you have a form of contract covering cases of this kind, we wish you would send us a copy.

"We think that this matter is a very important one of the members of the Association, and if some such a form does not now exist, we think that the Association should take the matter up and draw up some form under which all the members will submit their estimates."

Is there any logical reason why you should allow that condition to persist? Certainly not. Should we stand idly by and permit, nay, actually force our buyers, either collectively or individually, as they are doing, to devise protective contracts—protective principally to themselves—which they demand that we sign, when **we sell them millwork** Again, the answer is an emphatic "NO." Moreover, the remedy is so self-evident and effective, that it seems amazing that it has not been generally applied heretofore. Admittedly, you need a uniform contract or agreement. Such a contract form is printed herewith in full. I might explain that this form of agreement is not a Bureau compilation, but that is was prepared some ten years ago by a northern member, under the direction of counsel. It is a fair and just contract which explains why it has remained in use for ten years.

A Modified Blanket Bid

The memorandum list referred to in Article I, under "Extent of Work," is, in effect, a modified blanket bid; that is, it enumerates, under the title, "This estimate includes," the general classifications of material that in the bidder's eyes constitutes the millwork. Those items that might not be considered millwork, or those that for one reason or another the bidder does not wish to furnish, are enumerated also, under the title "This estimate does not include." The following is an example of such a modified blanket bid:

This estimate includes: All exterior door, window, and sash frames, set up, with pulleys placed; all windows, sash, and transoms, open; all weights and cord for check rail windows; all panel and sash doors, open; all interior frames KD and machined; all interior standing trim KD cut to approximate length; all base, picture mould, wainscot cap; 1 colonnade, columns not attached; 1 buffet, set up; 1 set pantry cases, set up; 1 mantel, set up; 1 seat, set up; 2 closet cases, set up; 1 medicine case, set up; 1 flight stairs, 1st to 2nd floor fitted & KD; all outside moulds, except as noted below; all verge boards; all rafter ends; all gable brackets, set up; all porch posts for front porch only; all rear porch rail and balusters; 1 rear porch newel.

This estimate does not include: Coal chute; priming, painting, nor finishing; interior finish for basement; thresholds nor closet shelving; glass; hardware, except pulleys and weights; rough stair carriages nor platform flooring; basement stairs; rabbeted, square edge, nor bevel edge moulds for ex-

terior cornices and beams; matched and beaded material for exterior; outside steps; rear porch posts.

In making the quotation, the memorandum is, of course, accompanied by a proper letter stating the price, terms, etc., and the phrase "as per memorandum list attached."

Permit me to point out that this form of quotation and the subsequent agreement define what is millwork. Moreover, the definition fits each particular job, which is important. The Southern Sash, Door & Millwork Manufacturers' Association some time ago adopted, and had printed, a combination uniform bid and contract form. Its psychological effect on the prospective purchaser condemns it, for, in order to be applicable to all jobs, it must list all items that are, or might be, considered millwork. Such items as do not occur on a given job are stricken through, and what remains is then the millwork included in the quotation.

UNIFORM CONTRACT FORM 1915 3M-9-15

Millwork Agreement

MODERN MILLWORK CO

This Agreement. made.....192.... by and between MODERN MILLWORK CO (hereinafter designated the seller), a ..... corporation, of ..... and.....(hereinafter designated the Buyer), of.....

WITNESSETH; that said parties, each in consideration of the agreements herein contained to be performed by the other, agree as follows:

Article 1. The Seller will furnish to the buyer free on board cars, consigned to..... the millwork for the..... to be erected at.....in accordance with memorandum list dated..... same being attached herewith and forming a part of this agreement. Of the items enumerated as included in said list, the Seller agrees to furnish sufficient to complete the work covered by this agreement in accordance with plans and specifications prepared by Architect..... of.....

Extent of Work

Article 2. All communications or agreements between the parties hereto or their authorized agents, whether verbal or written, which have been heretofore had or made, contrary to the provisions of this contract are hereby withdrawn and annulled. This contract with memorandum list attached alone constitutes the agreement between the parties hereto. No future change in any portion of the work covered by this contract or any instruction or information relating thereto shall be binding upon either party unless such change, instruction or information is in writing

Previous Agreements, Future Changes.

Article 3. Unless otherwise specified, the work included in this contract is to be executed in accordance with the plans and specifications prepared by the architects and such additional drawings and explanations as may be necessary to detail and illustrate the work to be done. Such additional drawings and explanations are to be furnished to the Seller who agrees to conform to and abide by same, so far as they are consistent with the purpose and intent of and are in accord with the original plans and specifications above referred to

Drawings, Specifications, Details.

Article 4. All measurements and information in connection with such portions of the work under this contract as are necessary for its proper manufacture are to be furnished by the Buyer to the Seller The Seller will make written requests of the Buyer for such information and measurements as it deems necessary on conveniently arranged blanks for the purpose, and the Buyer agrees to furnish the necessary information and measurments as soon as same can be established or are available

Measurements and Information.

Article 5. The work and material included in this contract shall be furnished in proper sequence so that the construction of the building may be continued without delay It is agreed, however, that a reasonable length of time will be allowed the Seller, dating from the time the necessary information and measurements are received by the Seller, to manufacture and furnish the work covered by this contract. The Buyer agrees to examine and check all shipments as they are received and report promptly to the Seller any shortage or errors, so as to give the Seller the opportunity and privilege of supplying any deficiency of material or to correct any error in manufacture No labor is to be performed or material is to be furnished by the Buyer and charged to Seller under this contract without written approval from the Seller except when the Seller's further performance of this contract has been formally terminated under the provisions of Article Six. Unless otherwise specified no material is to be installed or set up in the building by the Seller

Shipments, Errors and Shortages. Installation.

Article 6. Should the Seller at any time (except under conditions hereinafter described in this article) fail to supply sufficient material of proper quality so that the construction of the building may be continued without delay and the Seller through its own negligent acts or omissions is wholly responsible for such failure, the Buyer with the written approval of the architect shall be at liberty after five days' written notice to the Seller to terminate the Seller's further performance of this contract and proceed to procure from some other source, at reasonable prices, the necessary material to complete the work covered by this contract. In such a case the Seller shall not be entitled to receive any further payment under this contract until all of said necessary material has been so procured by the Buyer, at which time, if the unpaid balance of the amount to be paid under this contract shall exceed the expense incurred by the Buyer in furnishing the work, such excess shall be paid by the Buyer to the Seller; but if such expense shall exceed such unpaid balance, the Seller shall pay the difference to the Buyer

Parties Failure In Performance of Agreements

It is further agreed, that should the buyer refuse at any time to make payments to the Seller as provided in Article Eight (except under conditions heretofore described in this Article), the Seller shall be at liberty after five (5) days' written notice to the Buyer to discontinue further shipments of material under this contract until all delinquent payments are made.

Article 7. The Seller shall not be responsible for loss, damages or delays in delivery of any materials occasioned by the transportation company, but agrees to render to the Buyer every reasonable assistance in the collection from the transportation company of any claim growing out of the above causes. The Seller shall not be responsible for any delays in the delivery of any material under this contract resulting from fires, strikes, lockouts, or any other cause beyond its reasonable control.

Loss In Transit, Strikes, Fires, Etc.

Article 8. The sum to be paid by the Buyer to the Seller for the work and material covered by this contract is.....

Contract Price. Terms. Freight Credits

The Buyer shall pay the freight charges on said material to the point to which it is to be consigned; but on presentation to the Seller of the receipted original freight bills, the Buyer shall receive credit on said purchase price for the amount of same, but such credits shall not extend to any Federal or other tax on materials, shipments, or freight bills. The moneys to be paid by the Buyer to the Seller are to be paid as follows: Shipments or deliveries will be invoiced at their approximate value and eighty-five (85) per cent of such charges are to be paid at ..... within thirty (30) days of the date of such invoices, and final payment shall be made at ..... within thirty (30) days after the completion of the work included in this contract.

Article 9. No payment made under this contract, except final payment shall be conclusive evidence of the performance of this contract and no payment shall be construed to be an acceptance of defective work or improper materials.

Article 10. The Buyer reserves the right to make such changes in, additions to, or deductions from the work or material included in this contract, occasioned by alterations or changes in the original plans and specifications. Such changes occasioning additions to or deductions from the above named purchase price shall be made at fair valuations therefor No changes or alterations in work once ent or in process of manufacture can be made except at the expense of the Buyer for loss of labor and material.

Changes In Work

Article 11. The Buyer shall, during the progress of the work, maintain insurance, or see that insurance is maintained on the same against loss or damage by fire, the policies to cover all work incorporated in the building, and all material for same in or about the premises or elsewhere in the possession or under the control of the buyer and to be made payable to the parties as their interest may appear

Insurance.

Article 12. In case the parties to this contract fail to agree in relation to any matters in dispute that are not covered by the provisions of this contract, then the matter shall be referred to a Board of Arbitrators, to consist of one person selected by each party to this contract, these two to select a third The decision of any two of this Board shall be final and binding on both parties hereto. Each party shall pay one-half of the expense of such reference Should either party fail or refuse for a period of five (5) days after written demand has been served on him for an arbitration, to appoint an arbitrator or submit the matter in controversy to arbitration, then and in that case he shall forfeit and waive his contentions in any matters under controversy

Arbitration.

The said parties for themselves, their heirs, successors, executors, administrators and assigns do hereby agree to the full performance of the covenants herein contained.

IN WITNESS WHEREOF The parties to these presents have hereunto set their hands the day and year first above written.

MODERN MILLWORK CO

By .....

.....

By .....

A contract form that is fair and just and provides for proper protection

Three Suggestions

Now then, the ordinary job does not acquire all the items printed on that proposal, with the result that, after striking through what is not figured, there seems to be more excluded than included. The effect on the prospective purchaser cannot be good. Then also, it seems preferable to divorce the acceptance from the proposal at the time of quotation. Once the customer has decided to buy from you, then I believe is the time to set forth your terms of acceptance, etc. Aside from those two objections, which are purely of a psychological nature, your present form lacks many essential provisions. It is a contract, but an inadequate one, because a contract should protect you and your buyers, which your form does not. I will suggest, therefore, that you act along the following lines:

1. Get your estimators right in respect to quantity survey. Your cost problem itself, I believe, is rather well taken care of, but there is much room for improvement in the routine of listing plans.

2. Dispense with your present form of quotation and substitute the one suggested; namely, the modi-

fied blanket bid, which is fair to you and fair to your customers.

3. Adopt a uniform contract that will assure you one hundred per cent. protection and your buyers the same measure. The tested agreement which I read takes full cognizance of fair dealing and protection, and any instrument that ignores those two essentials will not long survive.

When Expense is Saved

Does it not seem unbelievable that this great industry called "Millwork," related so intimately with the development of the human race, the medium through which is supplied the permanent furniture for Homes, should in this age be required to occupy itself with simple business fundamentals? Regardless of whether we like it or not, those are the facts and I urge you not to ignore them but to take concerted action now.

I spoke of competition. Can you visualize any competition worthy of the name that does not involve an identical list of quantities and a logical consideration of cost, which would be your actual cost based on your own experience? Perhaps, that fellow who always takes your jobs, and whom you have "cussed" and called a price-cutter, is actually a good business man who does not furnish the "millwork complete" because the meaning of that term is too variable, but "as per memorandum list attached," and when he gets a job protects himself and his buyer through the employment of a fair agreement—not the buyer's form of contract, but his own, the seller's, by the seller's prerogative. In using that kind of contract, he automatically reduces his costs because it tends to eliminate errors in construction, stimulates collections and little, if anything, need be charged to the bad debt account. So it may be that that particular "rascal" is just a few steps ahead of his accusers.

Are Step or Flush Pulleys Preferable?

Which Do Our Readers Think Are Better?—"Hemlock Bill" Asks the Question; Let's Give Him Our Experiences

Have our readers any ideas with regard to the respective merits of step and flush pulleys on woodworking machines? On this matter there has been considerable difference of opinion, some machine operators preferring the one type of loose pulley and some the other. Undoubtedly a great many of our readers have had sufficient experience with either or both to be able to venture an opinion as to which is the best type. Such opinions would be welcomed by the editor whose attention has been drawn to this matter by a letter which has come from a woodworker who signs himself "Hemlock Bill." This letter states a case for the flush type of pulley, the writer claiming that such a pulley with ball bearings will solve belt troubles and should be ideal. A live discussion on this topic may help to clear up some of the difficulties and uncertainties of loose pulley practice. Will our readers, therefore, give the editor the benefit of their experiences? The letter referred to above is as follows:—

Dear Editor:—

The loose pulley problem like the poor is always with us. Loose pulleys at the best are an abomination and an ever present cause of trouble but it is not their general cussedness upon which I wish to unburden myself this time—it is the question of steps or no steps.

My present boss is strong for loose pulleys with steps—that is, the loose pulley is made somewhat smaller than the tight pulley and with a taper flange to assist the belt when shifted to climb up on the tight pulley. The contention is that when the machine is stopped the belt being on a smaller pulley the extreme tension is relaxed with a result that bearing trouble is somewhat lessened. My experience has been that it did help some, but in so doing caused a whole lot of belt troubles.

Unless the belt shifter was set just so, the belt soon formed a habit of climbing up on the taper flange and starting the machine, sometimes with disastrous result. One thing it did do—it soon stretched on the high side so that the laces were forever breaking. Some relief can be got from turning the belt over and letting it stretch on the other side but it was soon worse than ever. A belt stretched on one side is useless for from an inch to half its width in driving efficiency.

The boss says that these remarks are true only on pulleys that have too great a step, say 1 inch, but it appears to me that a quarter inch step that he talks about would not be much good.

My contention is that the loss of power delivered and the damage to good belting more than offsets any advantage gained. It seems to me that a good ball bearing would solve most of the bearing trouble This used on a flush type pulley would also solve the belt troubles and should be ideal.

I would like if some of the other fellows would take the time to make known their experience in this matter and hope that you can see your way clear to let some of the boys air their opinions.

Yourt truly
Hemlock Bill

Westinghouse Gear Book

In order to acquaint the industrial gear user with the advantages of Micarta Gears, the Westinghouse Electric & Manufacturing Company has issued a 20 page booklet, Folder 4506, entitled "Salient Facts on Silent Gears." The booklet describes the advantages of the use of Micarta gears and pinions and gives photographs and data describing some of their applications, tables of gear data, etc., enabling the gear user to judge whether or not they are applicable to his machinery.

It would be very interesting if every man who uses the word "tension" when speaking of saws gave a definition of what he meant.

How Produce Better Work from the Moulder?

Defects and Marks on Finished Stock Generally Due to the Conditions Under Which Machines are Operating—To Get the Most Out of Planers and Moulders Look Particularly at the Cutters and the Drive

Can it truthfully be said that the cause of defects and marks on planed boards and mouldings often lies with the machines? Isn't it more reaosnable, in view of the present high development of planers and moulders, that the fault more probably lies with the conditions under which the machines are working?

At the present time, varied forms, stock patterns of casings, crown mouldings, and the like are being put through on fast-feed moulders at a rapid rate. This is made possible by hard, high-speed cutters, properly ground, set and jointed. The self-hardening cutter is also primarily, the secret of advances in fast feed rates for planers.

Development along this line has resulted in improvements to a high degree throughout the machines, with the purpose of increasing the efficiency of operators. However, in replacing many hand operators with mechanical adjustments, a better understanding of the care and adjustment of knives and working parts is required than ever before. Some men do not understand this and consider that the efficiency of these various devices will offset carelessness and inaccuracy on their part.

Cutters Must be Balanced

The idea that the small actual bulk of the thin knives is a reason for less careful use of the grinding machine has also been expressed, this idea being supported with the argument that the comparatively small amount of metal involved would not throw the thin knives out of balance because of slipshod grinding. On the contrary, the exact balance of the cutters is a matter of vital importance in the successful working of planing and moulding machines. An absolutely perfect balance is always to be preserved. Cutters should not only be of exactly the same weight and overhang, but all must be made to agree accuracy. The importance of this is clear when the high velocity at which they have to run is considered. Consequently, inequalities are enormously multipled by the centrifugal force set up, the result being transferred to the wood in the form of marks and also by the more rapid wear of the bearing due to the constant jarring.

As the high-speed cutters are unquestionably with us to remain, it is absolutely necessary for operators to understand how to keep the profiles of knives exactly matching, sharp, evenly jointed and set at the proper angle for the wood being worked.

In touching on the various other reasons for trouble caused by no fault of the machines, those who have had considerable to do with modern methods may find little that is new to them in the remarks to follow, except that a forgotten suggestion or two may help them overcome any defective condition of finished stock.

Causes of Defective Moulding

In the first place it does little good to continually correct trouble in a machine that is placed on an old, shaky floor. Vibration is the natural enemy of all machinery possessing fast revolving parts. A shaky floor will often undo the effect of a stiff bed and frame, and develop vibration. If it is necessary to install machinery under conditions that seem to invite vibration, at least stiffen the floor directly underneath the machines with a couple of timbers, which will be of some help.

Planers and moulders should never be crowded into an out-of-the-way corner, as capacity will fall off, owing to the difficulty in getting to them with stock. Plenty of working room is an aid in handling stock and more positively assures the safety of workmen.

Badly joined belts, or belts that are not running true, owing to the machine being slightly out of line with the power shaft, will cause a break or irregularity in the speed of feed rolls and cutter heads, resulting in marked stock.

To perform their work most satisfactorily the cutterheads must be driven at a specific rate of speed. If they are driven too slow, for instance, the finished product will be inferior, as the knives will be unable to do their proper share of work. When the matter of cutterhead speed is guessed at, there is no certainty that the machine is working as efficiently as it should. An economical, sure and simple way to make certain in this matter is to apply a speed indicator to the centre of each cutter-head shaft.

Irregularity in the driving or feed of machines is often caused by a line drive of insufficient power, so that as the various heavy machines go on and off the speed of the main power shaft slightly slows down and speeds up correspondingly. Motor drives will prevent this condition occurring.

Worn feed-rolls or table of machine, or feed not square or true is often caused by a majority of stock being run through the centre of the machine. Divide your work, using the sides and centre of bed as equally as possible.

Excessive Pressure Causes Marks

Excessive feed pressure on wood will mark the stock, and also likely cause an accumulation of gum, etc., on feed-rolls, which will make a smooth finish impossible. In working rough, wet or snowy lumber, smooth feed-rolls will slip over the material without feeding it and make depressions. In order to avoid excessive pressure in feeding this class of stock, corrugated, sectional rolls should be used. On the other hand, care must be taken not to set the bottom feed-rolls too high, as nipping of the wood will result.

Insufficient or loose pressure bars or rolls for holding the wood down firmly when under the operation of the cutters will result in wavy, irregular cutting as the boards jerk alternately in and away from the knives.

A poor grade of output will result if cutter spindles are of too small diameter—if the heads are not properly balanced and in line—if shavings, chips, or dirt wedge between the cutters and the block—if bearings do not fit the spindles close enough, or are loose in their beds—and if the base and frame of ma-

chine is not strong enough to take up the vibration in working.

If the machine is of a make new to your experience, master its complete operation and adjustment before attempting to operate it. And then if you will observe the suggestions made above, you will save time, trouble and unnecessary expense in your planing and moulding work.—Yates Quality.

Mr. Cawkell Sees Signs of Encouragement

The Manager of the Furniture Manufacturers' Association Quotes Facts and Figures on the Situation in the Furniture Industry— What is Needed is Co-Ordination

An abstract of an address to the Hamilton, Ont., furniture retailers

There are in Canada according to government reports for the year 1919 some 270 plants making furniture, (including a number of small upholstering shops), and the capital investment represented is $25,000,000. The number of men employed is placed at 9,000, the wages paid, $8,000,000, and the sales, $25,000,000. The sales, it will be noticed are about the same as the capital invested. That is one big difference between the retail and the manufactruing branches of the business. Up until a few years ago, manufacturers did not turn their capital once a year. Now they are doing a little better than once a year.

Annual imports of furniture run less than $2,000,000. They are not on the increase, but, on the contrary, are rather less than they have been. The figures quoted include such lines as kitchen cabinets, refrigerators, etc., and also suites bought as samples by manufacturers.

Mr. Wm. Cawkell

How Furniture Sales Compare With Sales of Other Commodities

It is interesting to quote figures on sales volume in other industries to show how they compare with the volume in the furniture industry. Automobile sales run about $151,000,000 annually (at wholesale); amusements calculated on the theatre tax alone, $44,000,000; candies, $45,000,000; cigars, $75,000,000,—these as against the $25,000,000 sales of furniture. In the United States the sales of furniture are estimated at $5.75 per capita, which is about double the per capita expenditure in Canada. It is also true, that the per capita expenditure in the United States runs higher in other lines.

A feature of the situation with regard to the furniture industry is the rise in cost of materials. Commodity prices have risen 17 per cent since June, 1921. Cotton and steel have shown particularly strong increases, but there has been a stiffening in practically all lines. Cotton price increases affect all textiles used in the furniture industry, steel affects screws, nails, beds, etc.

One of the most important indices of industrial conditions is the record of commercial failures. These have been particularly heavy during the past few years of stress. The number of commercial failures in Canada in 1918 was 790; in 1919, 720; in 1920, 1050; in 1921, 2,400; and in 1922, until October 19, 2,939. The liabilities in 1921 were $73,000,000, while in 1915, the next worst year recorded, they were only $41,000,000. This big discrepancy is of course partly accounted for by the increase in commodity prices.

Signs of Recuperation

I believe that the worst of the depression is over and that we may look forward with confidence to better things. 1921 was a year of deflation, this year has been a year of recuperation, the beginning of the upward trend. Fundamentally conditions have improved. Everybody has got back to serious work. Waste and inefficiency have largely disappeared. Manufacturers have been putting their houses in order, and the efficiency in our factories has increased tremendously. Another encouraging sign is that two of our basic industries, steel and cotton, are likely to be flourishing. The cotton crop will probably be 25% greater than last year. The steel companies have increased their employees' wages 20%, which is a sure indication that they anticipate a labor scarcity.

Monetary Situation Improved

The monetary situation is also improved. The banks have decreased their loans. Money is cheaper—and is likely to be for some time—and cheap money means trade expansion. Loans for hundreds of millions have been subscribed in a few days. There is more money available than can be used. Consider in Canada how bonds have been bought up.

Retail merchants have got rid of their surplus stocks and prices are, in the main, deflated. The employment situation is improved. Last year at this time some reports showed 3,000,000 people out of work on this continent. Now it is stated, there are only some 500,000.

The railways will be making extensions and additions to rolling stock. There is a big car shortage which will have to be made good. Building has been going ahead remarkably in Canada this year—the greater part being residence work. At least 20,000

houses are being put up this year, and it is the new homes that are the biggest prospects for furniture business. Government figures show that in 1919 there was $30,000,000 spent in the construction of residences; in 1920, $42,000,000; 1921, $40,000,000, and in the first eight months of 1922, $71,000,000. The effect of this great building activity should mean an increased demand for furniture next year.

The furniture industry has big opportunities ahead. What we need is co-ordinated effort to take full advantage of them. Associations will help the retailers through the strengthening of selling forces, the elimination of unfair practices, the dissemination of information on cost accounting, etc.

Wide Use For Basswood

It Has Several Desirable Qualifications—Its Application to the Furniture and Millwork Industries

Basswood is a wood that has a very diversified use. In almost every line of woodworking it finds some sort of application, for it has several qualifications that make it very desirable. Its light color, light weight, good working and seasoning qualities, and the fact that it takes printing well are advantages that are put to good use in the manufacture of boxes and other containers, planing mill products and millwork, novelties and toys, furniture, pianos, and other lines of wood products. A very complete analysis of the utilization of basswood has been made by the U.S. Department of Agriculture, whose exhaustive report in this connection is abstracted herewith as being of interest to woodworkers who have occasion to make use of basswood.

Basswood is an important furniture wood because it glues well and takes and holds screws and nails very satisfactorily. It is well liked for such parts as drawer sides and bottoms, mirror backing, and shelves, because it does not warp to any great extent. Basswood is often used for the inside and hidden parts of expensive furniture. It is not generally used for outside work in furniture, because it lacks the strength of other woods, such as oak and red gum, and does not have an attractive grain or figure for finishing in the natural state. It is, however, used in enamel work, for which purpose it is well adapted, because it has a uniform texture, takes paint well, and, since it does not shrink and swell to any great extent, it is not inclined to crack the enamel coating as many other woods do.

Basswood serves well for cores of panels finished in expensive veneers. It is especially well suited for producing curved surfaces in furniture, because it can be readily bent into various forms by steaming, holds its shape after it is dry, and glues well. It is in demand, therefore, as a core wood for curved and irregular surfaces which are to be covered with figured veneer. Basswood is valuable also as core stock for large panels, because it can be obtained in large, clear pieces. Experiments on panels show that there is less warping when a low-density core wood, such as basswood, is used than with a high-density core wood. The low-density core wood has the additional advantage of making a light-weight panel. Basswood, also, does not split so readily as many other light-weight woods and holds the veneer well. In the gluing process basswood absorbs the glue very readily; therefore, a liberal amount of glue should be used in order to avoid a starved joint.

Planing Mill Products and General Millwork

Basswood has been a favorite wood for many years for planing mill products, sash, doors, blinds, and general millwork, particularly for inside finish, because it machines to a smooth surface when seasoned, keeps its shape well, and takes finishes extremely well. It is one of the best woods for enamel work because of its uniform, clear, light color, smooth finish, and even texture, which absorbs and holds the paint evenly and well. It also finishes well with other paints and varnish. There is a greater demand for figured wood for these products, such as that of red gum, birch, and oak. Much basswood is used, however, for interior woodwork, especially for ceiling and in the form of wide boards for finishing and panel work. On account of its adaptability to cutting with tools, basswood serves well for moldings and carved work in interior finish of various kinds. Much basswood is also manufactured into bevel siding, but it is not so well adapted to exterior work because of its liability to decay.

Rising costs of the upper clear grades have had much to do with discouraging its use, for the dark-colored and streaked material of the lower grades is much less valuable for these purposes. Yellow poplar, birch, and the softer grades of pine are now generally used in place of basswood.

Large Prizes for Essays on Economics

Actuated by the desire to advance the study, and more general appreciation of economics, Alvan T. Simonds, president of the Simonds Saw Company, of Fitchburg, Mass., and Chisago, Ill., proposed an essay contest open to pupils of high schools and normal schools in the United States and Canada. Mr. Simonds offers two prizes of $1,000 and $500 for the best essays written by students on the subject: "The Lack of Economic Intelligence and some of the Injuries it has Caused Individual and General Welfare in the United States since 1860." Mr. Simonds hopes this contest will interest many in the study of economics, who might otherwise pass it by. He also expects it will aid in creating a public sentiment that will result in the practical study of the subject in secondary schools as part of the training of every teacher. Rules governing the contest have been prepared, and persons interested may obtain copies of them by addressing the Simonds Economic Prize Contest, 470 Main Street, Fitchburgh, Mass.

Reduce Costs

The successful manufacturer must be always alert to minimize his manufacturing costs. One of the most conspicuous illustrations of this happened a few years ago in the automoblie industry, where hundreds of thousands of dollars' worth of machinery had to be sacrificed to the junk dealer because of the invention of new machinery which did the work faster, better and cheaper. The immediate loss on the old machinery couldn't be considered. It was cheaper in the end to throw it away and get the new machinery. Not to have done so would have been suicidal.

The Requirements of Pneumatic Systems

Table Gives the Sizes of Connection Pipes Generally Used With Woodworking Machines—Requirements Have Changed Owing to Improvements in Machinery

In laying out a pneumatic system for the collecting of dust in factories certain quantities must be chosen arbitrarily by the designer, and the success of the installation depends largely upon his experience. It is quite possible for an inexperienced designer to lay out a system which will apparently work properly, but this generally results in a great deal of power being wasted. The engineers of firms making pneumatic systems, who are thoroughly familiar with the theory and purpose of such systems, can determine by calculation and by reference to their past experience just what size piping and fan are necessary.

It is not only in new plants that attention should be devoted to economy of power, but also in those which have been in operation for a number of years, and especially where conditions have changed. There have been constant improvements in the art of dust-collecting, and it is often possible for us to secure appreciable power savings by making slight changes in piping, joints, layout, fans, speed, etc.

Requirements for woodworking systems have changed rapidly of late, and further changes are taking place every day. This is largely due to the fact that modern machines run at much higher speeds than formerly, and produce a volume of sawdust and shavings that is correspondingly greater. Naturally larger apparatus is required, and if old machines are replaced by new ones, the dust-collecting system should be enlarged to meet the new conditions.

Type of Machines		No. of Connections	Diameter of Pipe
Swing Saws	Small size on dry kiln lumber, large on wet	1	3½ inches to 6 inches
Rip Saws	Dry Kiln Material	1	4 inches
	Not Dry Kiln Material	1	4½ "
	Self-Feed Saws	1	5 "
Table Saws		1	4 "
	For Box Factory Work	1	4½ "
Mitre Saws		1	4 "
Variety Saws		1	4 "
" "	with Dado Head	1	5 "
Double Saws		2	5 "
Gang Saw	(Dependent on size and number of saws)		6 inches to 9 inches
Band Saws	Blade under 2 inches wide	1	4 inches
	" 2 inches to 3 inches	1	5 "
	" 3 " 4 "	1	6 "
	" 4 " 6 "	1	7 "
	" 6 " 8 "	1	8 "
Jig Saws		1	4 "
Tenoning	Single Head	1	5 "
	Double Head	2	7 "
	Double End Double Head	4	10 "
Variety Moulder or Shaper	Single Head	1	4½ "
	Double Head	2	6 "
	Double Head, Heavy Work	2	8 "
Sanders			
	Belt — Less than 6 inches wide	1	4½ "
	" 6 to 8 and 10 inches wide	1	5 "
	" 12 and 14 inches	1	6 "
	Drum, 24 inches long	1	4 "
	" 30 " "	1	5 "
	" 36 " "	1	6 "
	" 48 " "	1	8 "
	" Over 48 inches	1	10 "
	Disc 24 inches diameter	1	5 "
	" 26 inches to 36 inches	1	6 "
	" 36 " 48 "	1	7 "
Arm Sander		1	4 "
Planers, Matchers, Moulders, Stickers, Jointers, etc: (all top and bottom heads).	Knives 6 inches to 8 inches	One Hood for Each Cutter	5 "
	" 9 " 14 "		6 "
	" 15 " 20 "		7 "
	" 22 " 26 "		8 "
	" 28 " 36 "		9 "
Side Knives	Under 15 inches		4½ "
	16–20 inches		5 "
	21–24 "		6 "
Hog	12 inches wide and under		8 "
	Over 12 inches		12 "

The sizes of connection pipes required for a dust collecting system

The sizes of connection pipes generally used with woodworking machines are given in the adjoining table which is recommended by the B. F. Sturtevant Co. While the table gives the sizes of connections commonly used with woodworking machines, it is not intended to restrict the pipe to these diameters, as the size varies with the quantity of shavings, the kind of lumber, its condition, whether wet or dry, and the variation in speed of the cutter heads. Modern high-speed machines require larger connections than older types, even though the cutters be of the same size. Experience will dictate just what increase is necessary.

If the system handles material, such as chips, etc., branch connections should preferably be located on the side of the main. When placed on the bottom they may interfere with the flow of material past the the opening, and should flow be reduced by closing or partly closing a blast gate, the solid material is likely to drop into the branch and cause choking.

James E. Stark Dies in the South

James E. Stark, one of the largest manufacturers and exporters of hardwood lumber in the United States, died at his home in Memphis, Tenn., on October 19th after an illness of six weeks. Mr. Stark came to Memphis from Chicago, where he was one of the organizers of the Chicago lumber exchange. He was one of the organizers of the Southern Hardwood Traffic Association, and had for years been officially connected with the American Hardwood Manufacturers' Association, and had aided in the formation of the Hardwood Manufacturers' Institute.

After a machine is invented it takes continual thought and attention to obtain the best results from it.

Getting Box Costs Down to a Proper Basis

The Purpose of the Differential Price List and How it is Applied—The Fallacy of Quoting on the Per Thousand Foot Board Measure Basis —Practical Examples

Up to the present time there seems to have been no more comprehensive way of comparing or pricing wooden boxes than by the per-M-foot-board-measure basis. This method, however, does not take into consideration size, quantity, cleats, printing, fasteners, whole or pieced stock, grades, different kinds of wood, different thicknesses of stock from which boxes are manufactured, etc. Therefore, in order that a more exact basis of comparison might be derived, the National Association of Box Manufacturers have adopted what is called a differential price list which has been developed after a great deal of study in connection with the cost of manufacturing boxes of various kinds and according to various specifications.

A brief outline of the purposes and advantages of the differential list was printed in the last issue of the "Canadian Woodworker." This present article will further explain the system and by illustrative examples show how superior the differential method of figuring prices is over the per-M-foot-board-measure basis.

The Theory of the Differential Price List

No wood box manufacturer will question the statement that it costs more to produce a small box than it does one of medium size, nor will he question the fact that as you increase the size of a box above a certain point, the cost of production increases with the size. To visualize the cost range , Fig. 1 may be of assistance. The curved line should indelibly impress upon the manufacturer's mind the facts as just stated. Acknowledging that the cost of production, based upon the per M foot measure varies with the size of the container that is being manufactured, why should the box manufacturer persist in quoting prices based upon the amount of lumber used in the order, at so many dollars per thousand feet? The only answer to this question is that it is easier to quote a price measured in dollars per thousand feet than it is to quote a price on the individual box, especially if the order comprises more than one size. Strange as it may seem there is still another reason why the average box manufacturer quotes a blanket price on an order without giving consideration to the variation in side; he does not know the differential to apply to the various boxes that will correctly take into consideration the difference in manufacturing cost.

A wood box manufacturer that quotes on the basis of the per thousand feet contained in the order, and assuming that the quotation covers a variety of sizes, or, if he quotes a price "per box," based upon per thousand foot prices without considering size of the individual boxes, he is in either case securing too much or too little for some of the boxes in the order. There are pages of figures in the Differential Price List that are used in arriving at a base price per one hundred boxes, from which discount is to be taken, this discount to be determined by the user of the book, and to be based upon his production costs. The theory of the differential is shown in Plate 1.

Two sample pages of the differential price list are produced herewith. They are but typical of the 49 similar pages that the list contains and which give data for boxes of all dimensions and thicknesses of stock. The list is based on surface measure and each item gives the list price of each pair of parts or each four cleats on the basis of 100 boxes. The extra charge for replaning each pair of parts is also given. This extra charge is for surfacing the re-sawed part when boxes are to have smooth surfaces inside and out. In addition to the 49 pages of the type illustrated there are several pages of data relating to extras, including such factors as tying, the use of whole stock, the use of different grades than "regular," cleating, printing, fasteners, and the size of the order.

To illustrate how the list is used a specific example will be taken. Assume a box conforming to the following specifications: 30 x 18 x 16½ in.; style

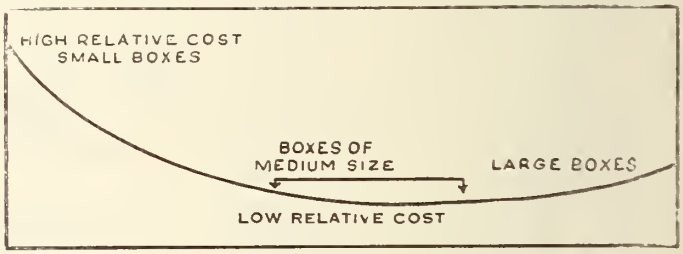


Fig. 1—This curve illustrates the principle at the basis of the differential price list

2; ends, sides, top and bottom 3/8 in.; cleats 13/16 x 2½ in. The following table gives the board and surface measure of each part and also the list price as taken from the differential price list.—

Cutting Size	measure Board	measure Surface	price List
Sides, 32-3/8 x 16½ in.	3.709	7.419	$24.55
T. & B., 32-3/8 x 18-3/4 in.	4.215	8.431	27.80
Ends, 18 x 16½ in.	2.063	4.125	14.11
Perpendicular cleats, 16½ x 5 in.	1.146	1.146	8.02
Horizontal cleats, 13 x 5 in.	.903	.903	6.35
	12.036		
Cleating (from table of extras)			3.00
			$83.83
Tying shooks (from table of extras)			2.51
List price			$86.34

In figuring box feetage, either board or surface measure, each pair of parts are treated separately—two ends, top and bottom, two sides, etc.

The example gives specifications for a style 2 box, a box having four cleats on each end. It is best, in order to eliminate unnecessary figures, to treat the two perpendicular cleats as one and likewise the two horizontal cleats. The cleats, being 2½ inches wide, show 5 inches on figuring sheet. The feetage for a pair of these would give the feetage for four cleats (either four perpendicular or four horizontal). This would give the feetage on the respective cleats for both ends.

The Differential List

We will assume that the foregoing box specification is one upon which cost and profit have been determined and that with lumber, labor, overhead and supplies costing a certain figure the box manufac-

turer knows he can sell it on the basis of $50.25 per M ft. B.B. and make a 10% profit. The problem then is to determine the discount that must be applied to the list price, as found from the differential price list, in order to secure the correct selling price.

As shown in the table above this particular order contains 12.036 ft. B.M. and the list price is $86.34. This is equivalent to $71.73 per M ft. B.M. The manufacturer, as indicated, can sell this box on the basis of $50.25 per M ft. B.M. and make a profit. The percentage off list to give $50.25 per M ft. B.M. is 70 per cent; or in other words, if a 30 per cent discount is applied to the list price as determined by the differential system, the price at which the boxes must be sold will be obtained. This same discount will apply to all other boxes regardless of size, style or extra operations with the assurance that the profit will be approximately the same in all cases, and it will not be necessary to change the discount until there has been a change in costs. Of course, it must be understood that each manufacturer must determine the discount that will apply to his own particular operations. No one discount can possibly apply to all conditions.

The Re-Sawed Box

There may be manufacturers today willing to quote the same price (on the per M foot measure) on 13/16 and re- sawed boxes. It costs less to manufacture one box having a total of ten feet of lumber. Regardless of this fact and the fact that it requires a better board for re-sawing than it does for the heavier container, many manufacturers are willing to give

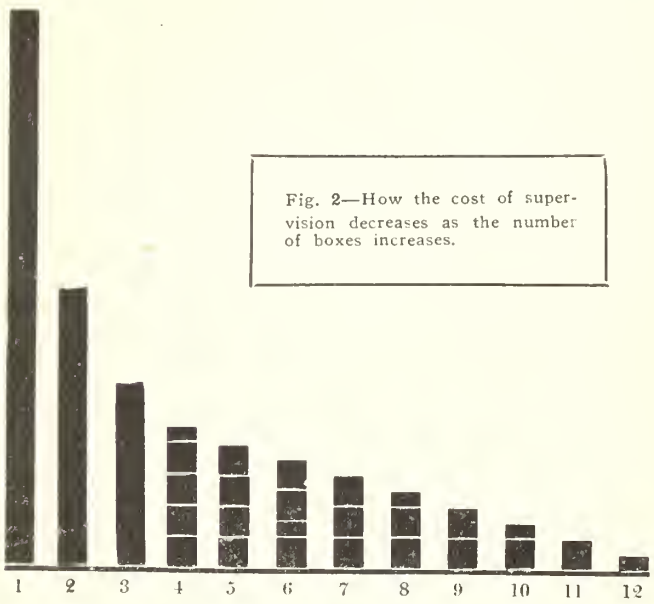


Fig. 2—How the cost of supervision decreases as the number of boxes increases.

List Price (Surface Measure) of Each Pair of Parts or 4 Cleats on Basis 100 Boxes

Feet	3/8 P. 1 S.	Replaning extra	Feet	3/8 P. 1 S.	Replaning extra	Feet	3/8 P. 1 S.	Replaning extra
			2.00	$ 7.02	$ .36	4.00	$ 13.62	$ .66
			2.05	7.19	.37	4.05	13.78	.67
.10	$ 1.15	$0.08	2.10	7.36	.38	4.10	13.95	.68
.15	1.25	.08	2.15	7.53	.38	4.15	14.11	.68
.20	1.36	.09	2.20	7.69	.39	4.20	14.28	.69
.25	1.47	.09	2.25	7.86	.40	4.25	14.44	.70
.30	1.59	.10	2.30	8.02	.41	4.30	14.60	.71
.35	1.71	.11	2.35	8.19	.41	4.35	14.76	.71
.40	1.83	.12	2.40	8.36	.42	4.40	14.93	.72
.45	1.95	.13	2.45	8.53	.43	4.45	15.09	.73
.50	2.08	.14	2.50	8.70	.44	4.50	15.26	.74
.55	2.22	.14	2.55	8.87	.44	4.55	15.42	.74
.60	2.36	.15	2.60	9.03	.45	4.60	15.59	.75
.65	2.50	.16	2.65	9.20	.46	4.65	15.75	.76
.70	2.65	.17	2.70	9.36	.47	4.70	15.91	.77
.75	2.80	.17	2.75	9.53	.47	4.75	16.08	.77
.80	2.95	.18	2.80	9.69	.48	4.80	16.26	.78
.85	3.11	.19	2.85	9.86	.49	4.85	16.42	.79
.90	3.28	.20	2.90	10.02	.50	4.90	16.58	.80
.95	3.44	.20	2.95	10.19	.50	4.95	16.74	.80
1.00	3.61	.21	3.00	10.35	.51	5.00	16.90	.81
1.05	3.76	.22	3.05	10.52	.52	5.05	17.06	.82
1.10	3.92	.23	3.10	10.70	.53	5.10	17.22	.83
1.15	4.09	.23	3.15	10.86	.53	5.15	17.38	.83
1.20	4.26	.24	3.20	11.02	.54	5.20	17.54	.84
1.25	4.43	.25	3.25	11.18	.55	5.25	17.70	.85
1.30	4.61	.26	3.30	11.35	.56	5.30	17.87	.86
1.35	4.78	.26	3.35	11.51	.56	5.35	18.03	.86
1.40	4.95	.27	3.40	11.67	.57	5.40	18.19	.87
1.45	5.12	.28	3.45	11.83	.58	5.45	18.35	.88
1.50	5.30	.29	3.50	12.00	.59	5.50	18.51	.89
1.55	5.47	.29	3.55	12.16	.59	5.55	18.66	.89
1.60	5.64	.30	3.60	12.32	.60	5.60	18.82	.90
1.65	5.81	.31	3.65	12.48	.61	5.65	18.98	.91
1.70	5.99	.32	3.70	12.65	.62	5.70	19.14	.92
1.75	6.16	.32	3.75	12.81	.62	5.75	19.30	.92
1.80	6.33	.33	3.80	12.97	.63	5.80	19.47	.93
1.85	6.50	.34	3.85	13.13	.64	5.85	19.63	.94
1.90	6.68	.35	3.90	13.30	.65	5.90	19.79	.95
1.95	6.85	.35	3.95	13.46	.65	5.95	19.95	.95

3"/8

List Price (Surface Measure) of Each Pair of Parts or 4 Cleats on Basis 100 Boxes

Feet	13/16 P. 2 S.	Replaning extra	Feet	13/16 P. 2 S.	Replaning extra	Feet	13/16 P. 2 S.	Replaning extra
			2.00	$ 13.80		4.00	$ 26.80	
			2.05	14.12		4.05	27.13	
.10	$ 2.23		2.10	14.46		4.10	27.45	
.15	2.43		2.15	14.79		4.15	27.77	
.20	2.64		2.20	15.12		4.20	28.09	
.25	2.86		2.25	15.45		4.25	28.41	
.30	3.08		2.30	15.78		4.30	28.74	
.35	3.31		2.35	16.11		4.35	29.06	
.40	3.55		2.40	16.44		4.40	29.38	
.45	3.80		2.45	16.77		4.45	29.70	
.50	4.05		2.50	17.10		4.50	30.03	
.55	4.31		2.55	17.43		4.55	30.35	
.60	4 58		2.60	17.76		4.60	30.67	
.65	4.86		2.65	18.09		4.65	30.99	
.70	5.14		2.70	18.42		4.70	31.32	
.75	5.43		2.75	18.75		4.75	31.64	
.80	5.73		2.80	19.08		4.80	31.96	
.85	6.04		2.85	19.41		4.85	32.28	
.90	6.35		2.90	19.74		4.90	32.61	
.95	6.67		2.95	20.07		4.95	32.93	
1.00	7.00		3.00	20.40		5.00	33.25	
1.05	7.34		3.05	20.72		5.05	33.57	
1.10	7.68		3.10	21.04		5.10	33.89	
1.15	8.02		3.15	21.36		5.15	34.21	
1.20	8.36		3.20	21.68		5.20	34 52	
1.25	8.70		3.25	22 00		5.25	34.84	
1.30	9.04		3.30	22.32		5.30	35.16	
1.35	9.38		3.35	22.64		5.35	35.48	
1.40	9.72		3.40	22.96		5.40	35.80	
1.45	10.06		3.45	23.28		5.45	36.12	
1.50	10.40		3.50	23.60		5.50	36.44	
1.55	10.74		3.55	23.92		5.55	36.75	
1.60	11.08		3.60	24.24		5.60	37.07	
1.65	11.42		3.65	24.56		5.65	37.39	
1.70	11.76		3.70	24.88		5.70	37.70	
1.75	12.10		3.75	25.20		5.75	38.01	
1.80	12.44		3.80	25.52		5.80	38.34	
1.85	12.78		3.85	25.84		5.85	38.65	
1.90	13.12		3.90	26.16		5.90	38.97	
1.95	13.46		3.95	26.48		5.95	39.28	

13/16

Two specimen pages of the differential price list

the extra service and to close their eyes when approaching the waste pile.

In the table below are given the specifications for two boxes, box No. 2 containing one-half the footage of box No. 1. If a man were quoting on both boxes on the per M foot basis, there would be no differentation in the price when reduced to a footage basis. A base price has been shown for each size, the price being obtained from the Differential Price List, and shows an additional cost of 42 cents per one hundred boxes (gros) to cover waste, expense of re-sawing and extra handling. The difference of 42 cents in price per one hundred boxes in favor of box No. 2 would vary with the discount applied by the manufacturer, and as has been previously stated the sales price is determined by the individual manufacturer after considering his costs.

Box No. 1

Style 1—13/16" all round
24x12x6

	Cutting Side	B. M.	S. M.	List
Sides	25⅝x 6	2.135	2.135	$14.79
T. & B.	25⅝x13⅝	4.849	4.849	32.28
Ends	12 x 6	1.000	1.000	7.00
		7.984		$54.07

Box No. 2

Style 1—13/16" Ends, ⅜" S. T. & B.
21⅜x12x6

	Cutting Side	B. M.	S. M.	List
Sides	23x 6	.959	1.917	$ 6.68
T. & B.	23x12¾	2.037	4.073	13.78
Ends	12x 6	1.000	1.000	7.00
		3.996		$27.46

To the laymen it appears easy for the box manufacturer to ascertain true costs. To the manufacturer it is a difficult problem. It is not difficult for a box manufacturer to find his production costs for a given period, but such costs are based upon the total footage manufactured during the period and do not differentiate between the various orders that have passed through the plant. A manufacturer might show a profit for the time considered, and yet have lost money on one or more of the orders handled.

A manufacturer whose main business is the production of canned food boxes, piano cases or shoe containers would know the cost of producing such boxes, but when asked to quote on boxes with greater or less footage, of different style or additional operations, he would be making a serious error to consider the production costs to be the same at that upon his regular line of manufacture. Without precedent, the quotation on such an order would be based upon 90 per cent guess and 10 per cent fact. The differential price list applied to such a condition will give the manufacturer the correct quotation.

The construction of the differential price list is such that the manufacturer can take one regular line of boxes going through the plant and upon which costs have been determined. use this basis upon which to arrive at a discount to apply to the differential, and apply it to any order, regardless of size, style, kind of material or quantity, and know that he was receiving relatively the same profit as he received upon the order, the true costs of which were known.

Quantity Production

The city factory expects orders of one or more boxes for local delivery, and to quote a price per M feet would mean, if the price be based upon an average cost, that again the purchaser would be paying either too much or too little for his containers. The cost of changing machines for a small lot order must be considered; the increase in supervision charge, the cost of delivery, bookkeeping and collections are all items that must be considered, for in each item mentioned the cost of handling is no greater if the order be one thousand than it would be if for but one box, excepting the delivery charge.

Fig. 2, shows the rapid decrease in supervision charges as quantity in the order increases. This matter is handled by the Differential Price List, and the extra operations which are to be added to the gross price of the order before taking discount, will assure the manufacturer of quoting a proper charge regardless of the size of the order.

The cost of supervision must be borne by the number of boxes produced. If one box is ordered, the entire cost is borne by that box; if two boxes are ordered, the supervision cost is divided proportionately. This chart shows relatively the propotion of the supervision cost borne by each box as the number of boxes on the order increases.

The differential price list, as written, applies only to box shook. The made-up box factory can use it, for all made-up boxes are shooks. Until such a time as the cost of nailing shooks into made-up boxes has been considered and reduced to a differential and included in the publication, it will be necessary for each individual manufacturer to consider his nailing and handling costs, and add such costs to the shook selling price, as determined by the differential.

Cutting up Logs for Dimension Stock Tests

A carload of red gum logs for use in a study of the best methods for drying small dimension stock was recently received at the Forest Products Laboratory at Madison, Wis. The logs were furnished the Forest Service by the Kraetzer-Cured Lumber Company, of Greenwood, Mo.

The logs will be sawed into small sizes at the laboratory sawmill, and proper drying schedules will be worked out. Red gum stock was chosen for these experiments because of the trouble which its users have had to prevent considerable degrade in drying.

The laboratory wishes to show how dimension stock can be dried at the sawmills, so that woodworking factories can buy it kiln dried instead of in a green or partially dried condition or in the form of long lumber or logs. When the latter are remanufactured at the consuming plant the result is a large loss of material, increased expense for labor, and extra freight charges for the waste stock.

A problem in kiln drying the small stock is the method of handling the small pieces economically. Handling the individual pieces is too expensive. Plans are to bundle the stock as it leaves the saw, thus cutting down the amount of handling.

Three methods have been suggetsed for drying dimension stock in quantities: (1) drying solid bundles, containing about 10 board feet, (2) drying bundles which have been made open to air circulation by small stickers, and (3) throwing the small stock loosely into bins as it is sawed, then drying it by the binful in the kiln. The efficiency of the three methods will be compared.

About 15 kiln runs will be made in the laboratory experimental kilns, on three sizes of dimension stock.

Upholstering and Trimming

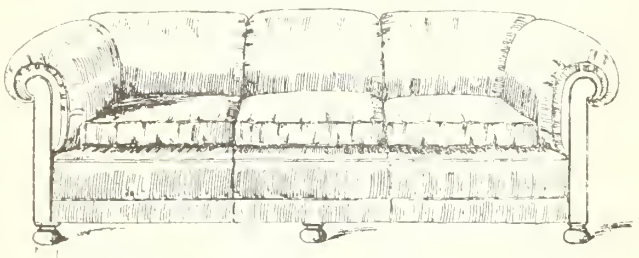
The Method of Upholstering a Chesterfield

The Same Principles Apply in the Treatment of the Larger Pieces of Down-Upholstered Furniture as in the Smaller Pieces

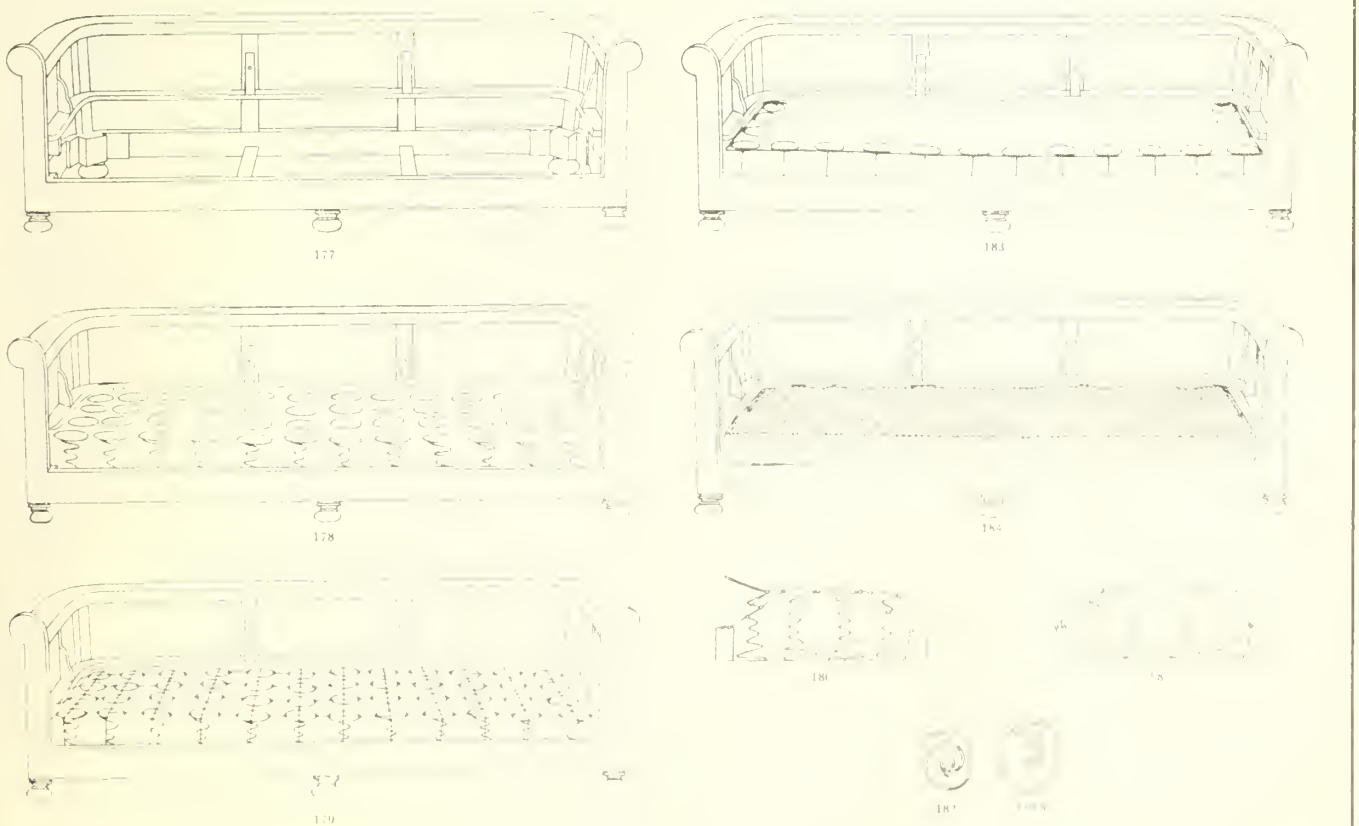
The larger pieces of down-cushioned furniture add a measure of complication to the work of upholstering, but are treated in practically all respects after the same manner as the smaller pieces. The Chesterfield illustrated at the bottom of this page is a typical example of a large piece employing down-top upholstering for seat cushion, arms and triple back, making with its deep-spring seat, spring arms and spring back a most luxurious piece of furniture.

The frame illustrated in Fig. 177, shows the general construction of the piece in question. This frame is webbed in the ordinary manner for 48 springs, placed in 4 rows of 12, as shown in Fig. 178. Prior to placing the first or edge row of springs, the top coil of each spring, which ordinarily appears as shown in Fig. 182, is opened and shaped as a long coil as shown in Fig. 182A so that it will project over the front rail. The end of the wire is also bent so as to lock in as shown in Fig. 182A. This elongated top coil is also bent so as to tip up after the manner indicated in the cross-section, Fig. 180.

The method of tying seat springs in spring-edge work has been covered in former articles of this series, but the details shown in cross-section, Fig. 181, will serve to recall the explanation. For those unacquainted with the preliminary processes of springing up, we would recommend the book "Furniture Upholstering" by John W. Stephenson, which explains at length the matter of placing and



The accompanying article describes the upholstering of this type of chesterfield



The various stages in the upholstering of a chesterfield

tying springs for spring edge, stitched edge and pillow edge work.

The next step is the attaching of the wire which forms the edge and in this case, as shown in Fig. 182, the wire edge is carried back on both ends so as to complete the cushion platform. Fig. 184 shows the burlap applied over the springs and stitched through and through back of the wire edge on the front and ends.

Our illustration does not show the springs sewn to the burlap, but on expensive work, such as this, it is customary to sew the springs to the burlap, knotting the twine at each stitch. Illustrations showing this process have appeared in connection with the pieces illustrated earlier in the series.

How Can Costs Be Determined in Advance of Manufacture?

A Question of Vital Importance to Makers of Upholstered Furniture—Faulty Cost Methods are Widely Used

At the recent annual meeting of the National Association of Upholstered Furniture Manufacturers, one of the features was an address on "Costs and How They May be Known in Advance of Manufacture," by W. L. Churchill, an industrial engineer of New York City. Mr. Churchill spoke in part as follows:—

When the Upholstered Furniture Manufacturers' Association asked me to tell them how to figure the cost of production in advance of its manufacture they disclosed one of the principle reasons for the limited adoption of cost determination by furniture manufacturers and they also call attention to one of the vital defects of typical cost collecting systems.

For the man or firm that attempts to determine the costs and proper selling prices of his products by collecting masses of detailed labor and material reports made out by their employees or by department clerks and foreman for them there is no way to determine in advance the cost of any new article proposed for production.

He can use his collected historical records of past performances on articles of similar construction as a guide in estimating, but the manufacturer who has had the experience of most furniture makers of getting estimates varying as much as 50 per cent—and that from the most practical of his foremen and superintendents—is not going to be satisfied with a cost system that fails him on this—too many vital details.

This failure of the typical systems, operated by collecting cost data from reports of current activities, is only one of the several weaknessess of this form of costing, although it happened to be an unusually dangerous defect for the furniture industry.

Prices Often Quoted Before Costs Determined

With frequent and radical changes in designs, styles, finishes, and even in types of furniture to meet the whims and fancies of a fickle buying public, it is frequently impossible for a manufacturer to get the benefit of even an experimental lot put through his factory before he establishes a selling price. He is even frequently called upon to quote prices from sketches, drawings and samples made by others.

When he sets such prices, that are subject to various determinations, according to who makes the estimates, he is facing two dangers: he may price too high, thus losing an opportunity for a satisfactory volume of profitable business that would be had if priced right, or the prices too low and gets a big volume of unprofitable business.

A costing method that does not give a cost in advance, and that will not get the same cost figures on any article no matter how many different persons may try to figure such cost, is not a satisfactory system for a manufacturer to use who has this problem to meet frequently.

A Wrong Principle

The whole difficulty is because of the acceptance and use of a faulty principle in costing. This principle is the attempt to saddle all the current changes in costs of operating and doing business upon the product that happens to be in process of production when these changes occur. Fluctuations in costs that are not due to anything inherent in the product are saddled on this process regardless of the fact that your customer insists upon a stabilized price. He won't pay you for the material or product that some careless workman may have spoiled; that has to come out of your profits. Why try to saddle the loss occasioned by that workman onto the particular chair he was making? Isn't it much better as a plain matter of management, to charge it to the account of the workman or his department, or to whoever is responsible?

When you will stop asking your accountants to compile costs by adding together all the detailed reports of workers, with their omissions, transpositions, errors and even falsifications, and instead furnish him standardized engineering costs details covering every unit and item entering into your products, then, and then only, can you figure your costs in advance of production. Such a step makes your accounting worth while, for it puts it up to one or a few trained people to supply accurate detailed information that cannot possibly be obtained from employee reports.

Introducing the engineering (or predetermining) principle into your costing means that instead of waiting for the completion of a lot of furniture to make a cost photograph you can make a detailed cost drawing in advance.

Mistakes Corrected Before Manufacture

When you get a cost photograph there is nothing to be done if the picture is unsatisfactory. Your money has been spent and the cost merely tells you that. With the engineering advanced detailed cost you are in position to revise, alter or adjust details until you have designed and developed the article to meet the cost and selling price requirements as well as those of appearance and service. It is much cheaper to make mistakes and correct them on paper in advance of manufacture than it is in the finished product.

It, of course, means the development and training of cost engineers to do this work for you as the supply of properly qualified people for this work is very limited. They are even scarcer than upholsterers; but, one engineer handles all the cost work for plants employing up to 200 people, and with the assistance of quite average type persons he can maintain a system for obtaining costs at less than 1per cent of your payroll and include estimating on new goods and all other work properly coming under the jurisdiction of costing for this insignificant trifle of expense.

Compare this factor of economy with that of high-

Eagle-Ottawa Leather Co.

TANNERS OF

FURNITURE LEATHER

OF EVERY DESCRIPTION

We are making a specialty of cutting

Spanish Split Leather for Chair Manufacturers

Quotations and samples furnished on application

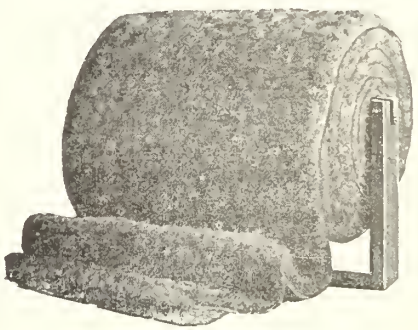
We will be pleased to supply a very attractive sample book, of all our grades on application.

GRAND HAVEN - - - - - MICHIGAN

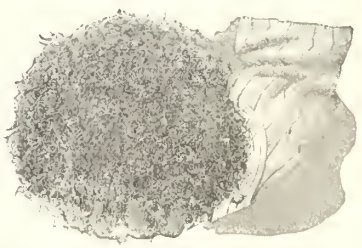
We extend a hearty invitation to all dealers to visit our exhibit at the Canadian Furniture Manufacturers Exhibition in Toronto, January 8-20, 1923. We wish our friends and customers a Happy and Prosperous New Year.

The National Mattress Felt & Batting Company
The "Comfy" Cushion Company
340 Gerrard St., East, Toronto

Woven Curled Hair



LOOSE-CURLED HAIR
In All Grades and Colors



Samples Cheerfully Furnished

BLOCKSOM & COMPANY

Sterilized Curled Hair

MICHIGAN CITY, INDIANA

Here's a Suggestion

Do you ever try keeping a file of your back copies of the "Canadian Woodworker"? Try it. Start with this issue. There are many articles that are worth keeping, as they offer valuable suggestions that will help you in your business.

MARIETTA WOOD AND METAL FINISH SPECIALISTS

The Stain Most Practical for the Purpose in Hand

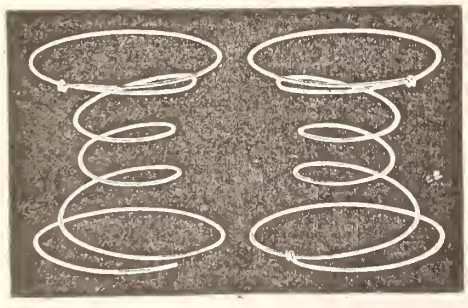
We are constantly developing new stains to meet the needs of different manufacturers and architects.

One of our strong points has always been our ability to produce the stains most practical for the purpose in hand after a careful study of the customer's problems.

The Marietta Paint & Color Co.

General Office & Factory, Marietta, Ohio.
Southern Office & Factory, High Point, N. C.
Branches: Columbus, Ohio, New York, Havana, Cuba

"IDEAL"
FURNITURE and UPHOLSTERY SPRINGS



Double or single cone, plain or knotted ends, in any height, shape or gauge of wire.

All "Ideal" Springs are made of "Premier" Brand—the best steel spring wire obtainable. Before shipping, the springs are japanned and heat-treated, giving an enamel finish and making the spring more resilient.

Catalogue and prices on application.

MADE IN CANADA by

Ideal Fence & Spring Co.,
of Canada, Limited
Windsor - Ontario

ly developed collecting cost system requiring a clerk for every thirty-five or fifty employees and with separate estimating and rate fixing forces and the further expense and annoyance caused by requiring employees to report their activities. The difference in cost of operation can easily become a 5 to 1 ratio, besides the greater accuracy, completeness and ability to cost in advance of production that the use of an engineer in costing offers.

In summing up, furniture men are urged to look into this principle thoroughly. It can well be the solution to their most vital problems. Those who have not already established costing methods will do well to investigate the value, economy and speed of installation of such a plan. One of its virtues it that it provides a plan for that capable son, nephew or other party that you desire to train into a thorough knowledge of the business.

The only way to figure costs in advance of manufacture is to adopt a method that figures costs on that basis. There is no makeshift that can be added to other methods that will accurately accomplish such results.

The engineer recognizes that the costs that you can and should pass along to your customers are practically fixed and subject only to revision with changes in market prices or in specifications of construction and methods of manufacture.

Knowing this, he wastes no effort collecting records of details. He does, however, tell you how much more rent you may be paying for idle space than you can charge into your products. He will tell you how much more or less you are spending currently for your goods than is the normal expectation and tell you what general costs you are wasting or gaining these amounts on.

When you send the boy to buy $1 worth of stamps and he loses them, the typical method of costing will tell you that fifty letters sent out cost 4 cents postage, as the cost of the lost stamps is placed on the letters for which they were purchased. The engineer, however, would have figured in advance that the letters would cost 2 cents each to mail and then would have said that the boy cost you $1 more than he should. The former cost report simply irritates you; the latter gives you a chance to correct a bad condition.

Discourage Sales of Mohair Covered Suites with Velour Covered Arms

At a recent meeting of the National Association of Upholstered Furniture Manufacturers at Chattanooga, Tenn., a couple of resolutions were passed, relating to mohair covered suites and to guarantees on imitation leather, which are of interest to all makers of upholstered lines. These resolutions are worded as follows:

"Believing that the manufacture of mohair covered suites with cotton velour covered arms is not to the best interest of the consumer, and, if continued, will react against our industry, we urge all members to educate their salesmen to discourage the purchase of such merchandise."

"As imitation leather has been used sufficiently long to demonstrate its wearing qualities, and, due to the fact that the guarantee has been much abused by many dealers, we recommend that all members who have not already done so, discontinue the guarantee of such covering material."

Reducing Finishing Costs

How High Quality and Lower Costs May be Reconciled—Many Economies Possible in the Labor Factor by Paying in Accordance With Production

By A. J. Cross.

The two main considerations in the finishing of furniture and other articles of wood are first, the quality of the finish and second, the cost. Of the two "quality" must necessarily take first place for upon it depends in no small degree the saleability of the finished product and to a certain extent the value and price which may safely be asked. While the cost of the finishing material itself and the labor involved in its application is proportionately small in comparison with the total cost of the completed article, it is doubtful if it is an exaggeration to suggest that a good finish adds anywhere from ten to twenty per cent. to the selling price. That is to say, that to take two articles identical in every respect and finish them with exactly the same material, only in one case doing a very ordinary job, while taking pains with the finishing of the second article so that what might be termed a quality finish is secured, the second item could command a price twenty per cent. in excess of the one which was just finished in a haphazard manner. Bearing these factors in mind the problem of reducing finishing costs, takes on added significance.

Quality Can be Improved and Cost Reduced

Actual experience has demonstrated that in the average finishing room the quality of the product can be improved and at the same time the cost of the work reduced. Such an accomplishment is doubly desirable for it not only enhances the value of the finished product but by reducing the finishing cost increases the spread between final cost and possible selling price. In doing this there are only two items with which to work, the cost of the material and the cost of the labor.

As it is essential that the quality must be maintained and even improved if possible, the idea of reducing the cost of the finishing materials does not appear to be very hopeful. It is true that small economies may be effected here and there through close attention to buying but this requires careful watching coupled with a thorough knowledge of the properties of the various items being purchased for the idea is not to buy cheaper material but to buy more cheaply. This may mean that in some cases it will be found advisable to pay more rather than less and yet be buying more cheaply.

When it comes to labor, there are many opportunities for effecting worth-while economies. In this, reference is not made so much to the use of modern equipment, and perhaps new and improved methods, as to increasing the productiveness of present equipment and methods. It is surprising what can be accomplished in this direction if gone about in a proper manner. For instance, the establishing of rubbing rates based on basic time standards resulted in a reduction of twenty per cent. in the costs of the finishing department of one large furniture factory. At the same time that this reduction in rubbing cost was secured, the quality of the rubbed finish was improved considerably. This was not accomplished by replacing hand rubbing with machine work, although the instructions called for the use of the rubbing machines on all surfaces to which they could be applied advantageously, but by the development of incentive rates on a fair and accurate basis, actually on minimum rubbing times as indicated on basic time standards.

Payment for Production

This is cited merely to show what has been accomplished. Working along the same lines, definite, accurate standards or rates can be applied covering all the finishing operations, including spraying as well as dipping, brushing, filling, sanding, etc. The payment of the labor employed in the finishing department by performance or production on rates that are permanent, accurate and fair, and which are based on minimum operation times, has long been recognized as desirable in every way but the trouble has been in the past that a definite basis upon which to establish such rates has been lacking.

Another point to consider is the placing of individual responsibility upon the shoulders of each workman. Not only should each finisher be held strictly responsible for his own work and penalized for faulty workmanship, but he should be held responsible for the quality of the work which has already been performed on the articles on which he works. This makes every finisher an inspector and has a surprising and extremely gratifying effect on the quality of the resultant finish and also on the number of rejects and repairs so often found necessary after the articles have been completely finished.

Each Finisher is Responsible for Good Work

This is developed in this way. Each finisher is called upon to carefully inspect each article before he does any work on it. If the preceding operations were not performed as they should have been he is to lay it aside and not put any time on it. Should he disregard this or through carelessness do work on articles that contain defects which could have been and should have been detected when it came to him, he is not paid for the time and work he put on each article afterward rejected. This means a lot, for usually a considerable amount of what should have been productive labor is thrown away on articles that are finally rejected. In this way this waste of costly labor and good material can be reduced to an appreciable extent.

These few suggestions barely touch the possibili-

ties for reducing costs that are to be found in the average finishing room. There is hardly an operation the productiveness of which cannot be increased by the application of good, sound commonsense coupled by a detailed analysis of every phase of the work and its bearing on succeeding operations. Past performances, either as to method or time, are not to be taken as a guide but each phase of each operation must be considered individually and collectively always with a view to increased output.

Is Your Finishing Department a Fire Menace?

The Possibility of a Serious Conflagration Should Emphasize the Advantage of Some Fire Protection Measures—The Manner in Which Gypsum Board Affords a High Degree of Security

By K. H. C.

The average finishing room presents very serious fire hazards. The very nature of the material used in this department—the oils, varnishes, etc.,—makes it essential to be always on guard, for these materials are very inflammable and once they are ignited, the flames are extremely hard to quench. The fumes and smoke which are generated contribute also to the difficulty of fighting the fire and instances are numerous of persons being overcome while attempting to put out fires arising from burning varnishes or other similar materials. In addition to a large quantity of inflammable finishing compounds, the average finishing room also contains a stock of furniture, cabinets or other wood products in various stages of completion. These, of course, fall easy prey to any flames that might arise. When once a fire starts to rage through all this mass of combustible material, it is quite possible that the flames will extend beyond the finishing room itself and will be ready to devour the whole plant, depending on the amount of resistance that is offered by the nature of the design and construction of the building. It does not tax the imagination, therefore, to picture a whole plant totally destroyed as a result of some little accident or act of carelessness in the finishing room.

Such serious conflagrations have frequently arisen, entailing heavy losses and the throwing of large numbers of workers out of employment. It is quite impossible to actually work out in dollars and cents the total loss that such a fire involves, for besides the well-defined and easily calculated loss of buildings, equipment and stock, there is loss of business, loss of time while a new plant is being erected, the loss that the firm have to face through not being able to meet competition, the loss that they may have to bear through their employees being hired by other firms, and other factors that cannot be computed in so many dollars and cents. It is obvious, therefore, that it is of the utmost importance for the owners of woodworking establishments to protect their property against fire, even against those fires that may seem insignificant, for who can tell when a spark may not be fanned into a very serious and disastrous conflagration.

Keep the Fire Localized

To guard against fires that may start in the finishing room and which, if allowed to spread, might cause the destruction of the whole plant, is then one of the most important matters to which the proprietor or manager of a woodworking establishment must attend. The inherent fire hazard of the finishing materials themselves cannot be avoided or overcome, but what can be done is to see to it that if any fire does start it will be confined to the immediate section of the plant in which it started. How can this be done? By using some form of fire resistive construction in the finishing room, so that a fire will be confined to that quarter of the plant until an opportunity is given for properly fighting and quenching the flames. This opens up the whole question of fire resistive construction. However, this article does not claim to exhaust the subject as applied to woodworking plants, but it will suggest the use of one tested and tried material—gypsum—as a fireproof agency.

Virgil G. Marani, an expert on the subject of fireproof construction, stated on one occasion: "It is a well recognized fact in fire prevention engineering that the fire hazard in construction regarded as combustible could be practically eliminated, or at least be reduced to a minimum, if the construction was of such character as to assure that an originated fire could be confined to its location of origin for at least ten minutes. The service of a fire department, or other means of extinguishing fire can, in the majority of cases, be obtained in much less time than the 'essential ten minutes' referred to. Construction requirements which will provide the 'essential ten minute' fire protection in combustible structures do not increase the cost of such."

Protection of this sort can be obtained by the use of incombustible lath and fire resisting plaster on the walls of finishing rooms—a type of construction that does not involve material increase in cost nor necessitate radical departure from present standard methods of construction.

Boards May Be Used Without Plaster

Any lathing material to be classified as "incombustible" must be of such character that it will not ignite or burn when subjected to fire. Present known materials which observe this physical requirement include metal lath in its various weights and forms and gypsum board. Gypsum plaster board might be termed "Incombustible Solid Lath" since the boards are erected in sheets which do not need to be perforated or distorted, in order to provide the mechanical key or clinch for the plaster, as is the case in other forms of incombustible lath.

The adhesion of gypsum plaster to gypsum plaster board is one of the remarkable characteristics of this form of incombustible lath. Repeated tests have demonstrated the high strength of the bond that exists between the plaster and the board.

Gypsum plaster boards alone (without the additional advantage of the plaster coats) afford an appreciable degree of fire protection wherever so used. For this reason a vast amount of gypsum boards have been used as wall surfaces without any plaster at all. The protection against fire has been all that could be desired. This is a type of construction that

may well be used in finishing rooms, although the use of plaster over the boards is superior.

Other uses of gypsum board without plaster include the following, all of which have some fire resistive application and are therefore of interest to the woodworker who is anxious to make his plant as fireproof as possible:

1. In the place of wood siding behind face brick or other masonry veneer, as an insulator.
2. In the place of wood siding behind the clap boards, as a fire stop.
3. Between wood siding and the clap boards of shingles, as a fire stop.
4. Upon the wood roof boards and under shingles or metal roof covering, as a fire stop and insulator.
5. Under the finished floor, or between the rough and finished floor, as a fire stop and sound deadener.
6. Within concealed air spaces as a fire stop.
7. As a fire protection to heavy timber (mill) construction, by being nailed direct to the wood members following the contour of the construction without creating concealed air spaces.

Gypsum Plaster Board a Low Conductor of Heat

The low heat conductivity of gypsum plaster board can be easily demonstrated by placing a small sample of the board, in a horizontal position, over a blow torch flame, and upon the upper surface of the board, place a piece of paper, a feather or other easily ignited and highly combustible material. So long as calcination is taking place it will be impossible to ignite the material placed on top of the fire test specimen. The insulation afforded by a 3/8-inch thick gypsum plaster board (without plaster) will prevent, for a period of about 10 minutes, the passage of sufficient heat, by conduction from the Bunsen flame, to ignite the highly combustible material on top of the sample. The temperature of a Bunsen flame averages about 1,800 to 2,100 degrees Fahr.

It is obvious from the foregoing brief reference to the properties of gypsum board that it is a material well qualified to give fire protection to woodworking plants and, more particularly, finishing shops. The makers of the product issue very explicit instructions regarding the method of handling it and by following these directions it is extremely easy to use it and thereby get a great measure of fire protection.

COTTON LINTERS
OF UNUSUAL QUALITY

Cotton Linters of guaranteed quality for the Mattress and Upholstering Trades. Quotations on this and our other lines—Cotton Waste, Reeds, Rattans, Turpentine, etc., will be gladly furnished on request.

Write for them to-day.

E. T. CARTER & CO., LIMITED

84 FRONT ST., E. TORONTO

The wood finish that resists the effects of ROUGH usage

Furniture finished with ZAPONITE—the Pioneer Wood Lacquer—may be struck a blow or jammed sufficiently hard to DENT the wood, yet the finish itself will remain UNHARMED.

Furthermore, ZAPONITE will not check. It will not crack. It will not craze. And, being moisture proof, its use prevents warping, swelling and shrinking.

Let our Service Division help you determine how ZAPONITE can be used in finishing your products at a SAVING in your production costs. Write us about this service TODAY.

Celluloid Zapon Company
200 Fifth Avenue, New York City
Branches: Chicago, New Haven, Los Angeles

THE PIONEER
ZAPONITE
WOOD LACQUER

A Better FINISH

You can improve the appearance and durability of your finishes and increase the saleability of your furniture by using

Cosmos High Grade Lacquers and Lacquer Enamels

Lacquer gives a permanent, waterproof surface that is tough and durable.

It dries rapidly, increasing the output of the finishing department. Successive coats may be applied at half-hour intervals, enabling work to be finished in one day.

Samples, prices and other particulars gladly furnished.

Our Specialties:

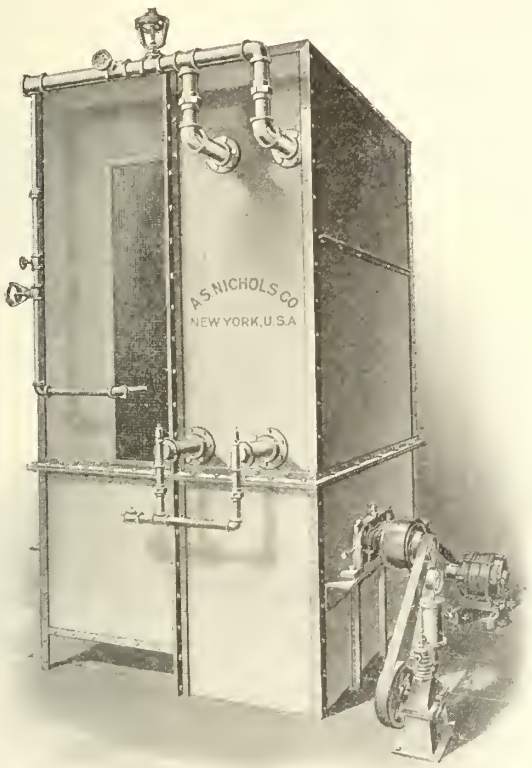
METAL LACQUERS
WOOD LACQUERS
ENAMELS
BRONZING LIQUIDS
EUREKA AIR BRUSHES
AMYL-ACETATE
REFINED FUSEL OIL
COLLODION
BRONZE POWDERS
MATCHLESS METAL POLISHES AND BUFFING COMPOSITIONS
BANANA OIL

Cosmos Chemical Company
Port Hope Ontario

The
ORIENTAL TEXTILES COMPANY
LIMITED
Oshawa, Ontario

Manufacturers of
Upholstery
Mohair
Velours and
Brocaded Mohairs

Agent
J. H. ALLEN
33 MELINDA STREET
TORONTO



Vertical Equipment Floor Space 4 x 6 ft.
Crated and shipped complete ready to set on the floor outside of your varnish room

YOU ARE PAYING FOR THIS EQUIPMENT—

while using old fashioned Varnish Drying methods.

The money you are losing will more than pay for this equipment in one year.

This statement is based upon a fact well known to manufacturers in every branch of the woodworking industry.

IT IS A COMPLETE UNIT of fan, motor, heaters, air compressor, with automatic humidity and temperature control.
is manufactured in sizes suitable to all requirements, both vertical and horizontal.
eliminates dust and dirt by the use of a new humidifying air washer without the use of sprayheads, pump and pipe connections.
will triple the output of your finishing rooms—practically eliminates sanding.
will decrease congestion in your factory.
will reduce investment of goods in process.
will improve working conditions for your employees.

"SET IT OUTSIDE YOUR VARNISH ROOM"

A. S. NICHOLS COMPANY

Aeolian Hall 33 W. 42nd St., New York City

Manufacturers of dryers for lumber, veneers, glued stock, varnish, paints, enamels, etc.

Increasing speed and reducing costs, while making certain highest quality work, in your finishing room with the

DeVilbiss
Spray-painting System

Whether you manufacture phonograph cabinets or chairs, metal cabinets or brass beds; whether you varnish enamel or lacquer those products, one DeVilbiss spray operator will do 4 or 5 times as much work as a brush finisher in the same time.

On every class and grade of work the sprayed-coating will be of highest uniform quality—free from brush marks, runs, fatty edges and like faults.

DeVilbiss exhausting equipment will insure a clean, healthful place in which to work, and reduce the fire hazard.

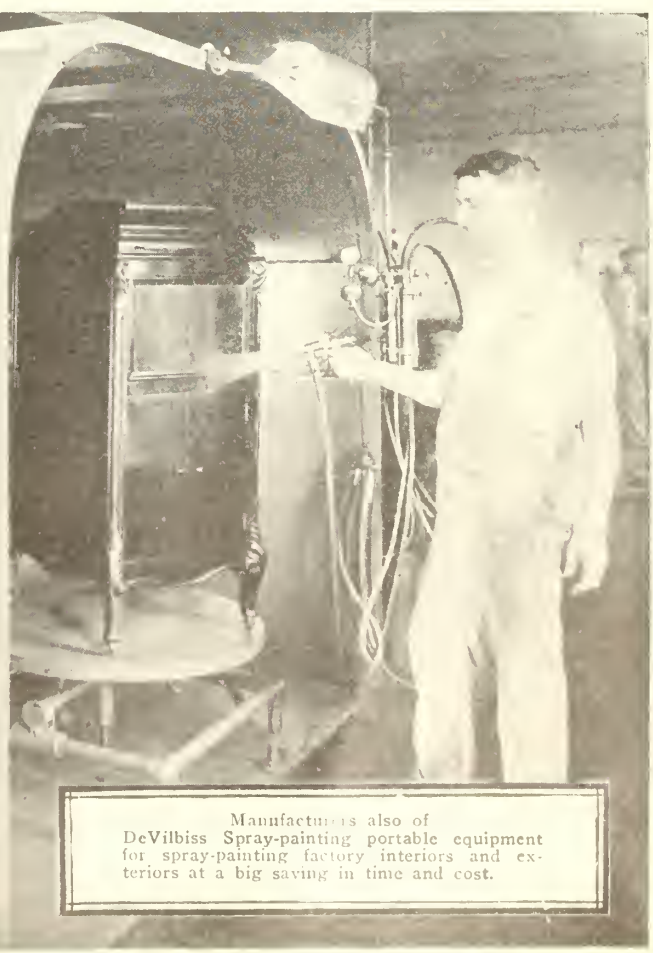
The outfit will be on the job every day, and cost little to operate and keep up.

These savings and advantages can be had in your finishing room, in the same profitable degree they are now enjoyed in thousands of wood and metal-working plants of every kind.

Let us mail you further particulars that meet your individual requirements

The DeVilbiss Mfg. Co.

3718 Detroit Ave. ***Toledo, Ohio, U.S.A.***



Manufacturers also of
DeVilbiss Spray-painting portable equipment for spray-painting factory interiors and exteriors at a big saving in time and cost.

BeVeCo VENEERS

At the Markets

Look For The New Finish

"Brown Bird's-Eye Maple"

Different From Anything Ever Shown

AT the mid-winter markets you'll see this beautiful new finish. It is so entirely different from any thing you have ever seen. A rich, warm brown that contains the decorative figure with which nature has endowed this wood.

Two-tone bedroom suites, novelty furniture, decorative overlays and inlays—all respond to the use of Brown Bird's-Eye.

See for yourself. It costs you nothing to send for a panel showing the finish.

Your foreman finisher will know how to obtain Brown Bird's-Eye when you show him a sample panel. He can do it easily without additional equipment or materials.

Write or wire your finishing house for a panel at once. Or send to us direct, we will see that you receive a finished sample immediately. This of course, obligates you in no way.

ADDRESS

BIRD'S EYE VENEER COMPANY
ESCANABA, MICHIGAN

"Brown Bird's-Eye Maple"

Veneers and Panels

Why Some Modern Glue Rooms are Failures

Inexperienced and Incapable Help will Offset any Advantages that Up-to-Date and High Priced Machines Might Have

By R. N.

A glue room equipped with modern machinery and labor-saving devices would naturally be expected to be able to turn out first class veneering and panel stock. That there are other factors, however, involved in turning out quality veneering than the mechanical equipment of the glue room is a point often entirely overlooked. First class equipment certainly is a great aid in turning out a quality product; nevertheless, unless this is backed up with experienced glue room help, the most modern and highest priced machines will avail nothing in this regard. I have observed incident after incident where the best grade equipment has proven a dismal failure, as far as production and quality of the veneering were concerned, simply because the "ruling powers" could not or would not obtain the proper type of men to operate this machinery.

This brings to mind an incident which happened some time ago in the veneer department of a large plant. A glue-spreader of the home-made variety had been in operation until one day when the manager decided to cut labor costs by installing modern equipment. The new glue spreader, however, was not to the liking of the workman and superintendent, consequently, after a short time, they reverted to the old glue spreader, claiming that the new type was a failure as far as turning out good work was concerned.

Here was an instance where the machine was capable of living up to all the claims of its manufacturer, but the human equipment employed was not. For some reason the man operating the spreader failed to run the same successfully, resulting in an uneven spreading of the glue and dry spots. The amount of defective work turned out soon convinced the manager that up-to-date equipment was useless unless it was backed up with the proper human assistance.

Hand Presses Not Always to Blame for Poor Work

There are other plants where the volume of work turned out can easily be handled with a hand press; nevertheless, the manager often finds that he must get a power or hydraulic press if he wants to turn out good work. Why? Because he has been told by the foreman that his hand press never was made for that kind of work anyway. But the real fault generally is due to the fact that the glue room man may have a dislike for the labor required to do good pressing with a hand press.

It should be remembered that hand presses are often used in plants turning out the most expensive work, but to get the full pressing power out of a hand press, it is essential that pressure be first applied from the center screw, and this must come gradually to force out the surplus glue towards the edges. When screws are first turned down full pressure should not be exerted at once, as this generally results in a flooded glue joint. A few minutes should elapse before applying full pressure. This gives the stock time to adapt itself and the surplus glue will come out, making a first-class glue joint. When complaint is made that it is impossible to do good pressing with a hand press, it generally will be found that the fault lies with the crew entrusted with its operation and that full pressure is being applied in one operation. No matter how rigid a press may be made, there will be some loosening up due to the flattening out of the wood fibre and if care is not taken in going over the screws, as the stock becomes adjusted to the pressure, loose veneers or blisters will be the result. The press will be blamed for the bad work, but the fault is not with the press, but rather with the screw.

Incapable Labor Will Ruin Good Equipment

On another occasion, the manager of a woodworking plant equipped his glue room with the most modern equipment available. He put in the highest priced and latest machines throughout, but inside of less than a year the total equipment was fit for the junk man, as far as turning out good work was concerned. Having bought the best on the market, the manager thought any inexperienced man could operate it and turn out good work. Changes in the glue room help were frequent and when I looked over this modern veneering department shortly after, I found that the glue heater was leaking and mixing water with the glue. The glue retaining troughs on the glue spreader, being of copper, were badly battered, so that no steam could be admitted to keep the glue warm while in the spreader, while the new hydraulic press was a wreck, the plunger on the press leaking so badly that the press barely held up pressure until the retaining rods could be applied. In short, this modernly equipped glue room was a dismal failure after a few months' operation.

If the manager of this plant had insisted on engaging a glue room man in the beginning who knew how to handle and operate good equipment, he would undoubtedly have reason to be proud of his glue room. But trying to save a few cents by engaging help who knew nothing about glue machinery operation was the fatal mistake.

Modern glue room equipment will always pay good profits, but only when handled by an efficient and capable crew.

Dovetailing is work which, to give satisfaction, must be done with a high degree of accuracy to insure a neat fit and a good glue-joint.

Is Balanced Construction the Solution?

What Will Eliminate the Warping Troubles that are so Frequently Met with in the Use of Plywood?—Keep the Material Straight and Control its Drying so as to Prevent any Moisture Interchange

By M. N. W.

Warping is one of the troubles most frequently encountered in the production and use of plywood. This is true to such an extent that the impression that warping is a troublesome but unavoidable evil is held in many quarters and for this reason little if any attempt is made to eliminate this trouble or at least to reduce the loss incurred because of warped and twisted stock.

Usually when a certain trouble is tolerated or accepted as inevitable, no attempt is made to overcome it. This holds true in most lines of endeavor and woodworkers are no exception to the rule; in fact owing to the conservatism which pervades this industry, ideas, like old customs and practices, are held with unusual tenacity. This held true with regard to kiln drying practice and losses, and may be seen in many other phases of woodworking as practiced to-day.

The Cause of Warping

Warping, whether in solid wood or in plywood, is usually caused by uneven stresses and strains set up during the elimination or absorption of moisture. The wood "usually" is included because warping may be caused by what might be termed mechanical means, in contra-distinction to natural causes; for instance warping due to an irregular distribution of sticks in a pile of drying material or in plywood, piling panels on an uneven foundation. Uneven stresses and strains are due to a number of causes, such as unequal drying in various parts of a panel, uneven distribution of fibres in the various layers which go to make up a piece of plywood and unequal pulls due to using wood of varying densities and strengths in opposing parts of the same piece.

This is the reason for the claim often made that warping and twisting of plywood may be eliminated by so constructing each piece that the various stresses and opposing stresses are equalized and naturalized. This means that a panel made with certain face stock should have a piece of wood of equal strength on the back. In this way the pull on one side would be counterbalanced by an equal strain on the other side. However, the variables in wood are too great to ever accomplish much in this direction for it is practically impossible to build a panel in which all the stresses and strains would be counterbalanced and equalized. Further, were such a construction practical all our fine calculations would be upset, unless the absorption or elimination of moisture occurred with absolute uniformity over all faces of the stock. There is this to be said for this idea, however, and that is, that it is far easier to keep a piece of plywood straight if attention has been given to its construction with a view to having opposing plys of nearly similar strength and texture.

From the foregoing it will be seen that something more than balanced construction is needed to eliminate warping and twisting. Theoretically the idea may be sound but it is not capable of a practical application and unless all conditions were ideal little would be accomplished in any event.

Some other angle of approach must be sought to the question of how to prevent warping. Lumber, either solid or built-up, sets when it dries and tends to retain the shape in which it was dried as long as there is no appreciable change in the moisture content of the piece. This is in line with the suggestion that warping and twisting usually occur when wood is either giving up or taking on moisture. If we can keep the stock straight when drying it and then see that the moisture content of the piece is held constant, we will have solved our problem.

Now we seem to be getting near what promises to be a practical solution. Holding the material straight and flat while drying does not present any real problem for it is merely a matter of piling and of seeing that plenty of sticks are used, and that they are placed properly, one above the other in regular rows. This is accepted as good practice in most plants, but it is a point that will stand emphasizing for it is important. It is necessary for the piles to be constructed properly to ensure straight, dry stock.

Keeping the Material Straight

Have our material straight and dry, how can we keep it in that state? Perhaps a coat of paint or varnish might serve to preserve what moisture may be in the stock and to prevent more being picked up. But no, experiments have demonstrated that the average woodfinish is not moisture proof, and while it might retard the flow of moisture from air to stock or vice versa it would not prevent such a movement. This is not to be used as an argument against finishing both sides of an exposed surface, but merely as a statement of fact. How then can we prevent this interchange of moisture?

It is known that when the moisture of wood comes in equilibrium with surrounding conditions and that as long as such conditions do not change, the moisture content of the wood remains constant. Then by drying our material to some predetermined point and then controlling the conditions with which the stock is afterwards surrounded, have we not solved our problem? Even now, though, we are faced with difficulties. While it is possible to control conditions in a furniture factory, an attempt to do so would involve an expenditure of no small proportions and might be considered to be carrying theory too far.

Perhaps a compromise could be worked out that would be a vast improvement over present methods. Suppose we determine the average E.M.C. of conditions in the plant, that is, the average moisture content that the stock reaches as it comes into equilibrium with the varying conditions encountered in the factory at different seasons of the year, and then dry all our material, solid as well as plywood, to this point; have we not then reduced to a minimum the tendency to pick up or give off moisture and with that the tendency to warp and twist? It looks like it.

(Continued on page 86)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

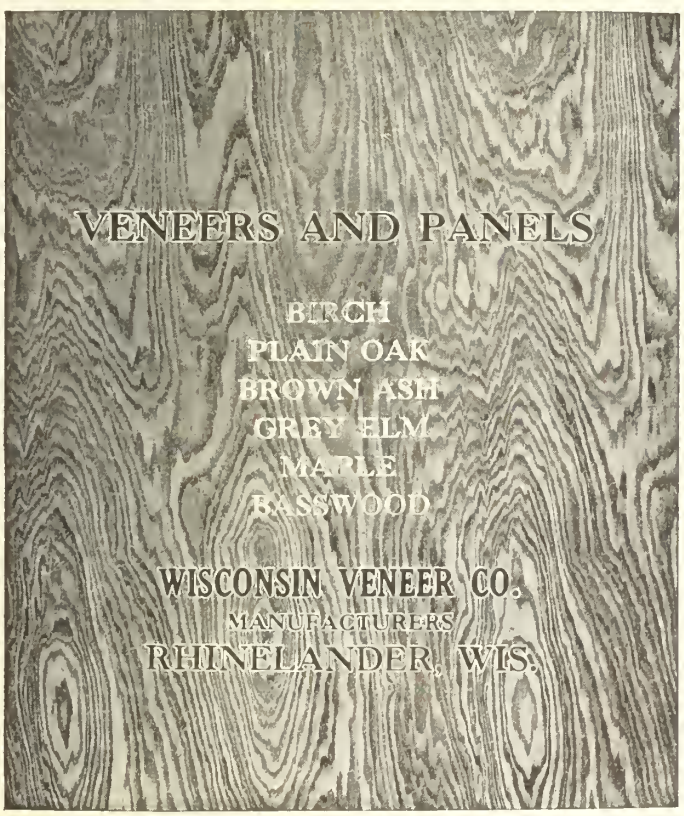
Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, — — CINCINNATI, OHIO.



Litton Veneer Co.

Office and Mill Rockford, Illinois

Manufacturers

American Walnut Veneer and Lumber.

Plain and Figured Veneers of All Kinds.

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.

(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.

HOFFMAN BROS. CO.

ESTABLISHED 1867 INCORPORATED 1904

Rotary Cut Veneer

at our Burnside, Ky., Mill.

Ready for Immediate Shipment

1	Car 1/20'	Red Oak (log run)
½	Car 1/16'	Red Oak (log run)
½	Car 1/20'	White Oak (log run)
½	Car 1/16'	White Oak (log run)
1	Car 1/28'	Walnut (half round)
25M	1/28'	Poplar Crossbanding
5	Cars 1/8'	Poplar (log run)
2	Cars 1/8'	Poplar (corestock)

Prices by wire on receipt of your inquiry

HB

Reg. U.S. Pat. Off.

FORT WAYNE, IND.

Exclusive Manufacturers American Walnut Lumber and Veneers

IT is generally conceded that this will be a bigger year than ever for Walnut Furniture and Interior Trim, and we are ready to supply the demand.

Your co-operation in early placing of orders will be of material assistance in helping to avoid an abnormally strong market which always reacts in higher prices.

We do not wish to see higher prices. Co-operation is the life of business at any time. At this time particularly you will find us as producers ready to co-operate in every way possible with consumers to ensure a steady supply of Walnut equal to the demand.

May we know your requirements early ?

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Branch Sales Office in charge of George C. Hall, 610 South Michigan Blvd., Chicago, Ill.

Branch Sales Office in charge of W. R. Thompson, 318 Mead Building Rockford, Illinois

Branch Sales Office in charge of C. A. Rugg, 110 West Second St., Jamestown, N.Y.

Branch Sales Office in charge of E. V. Williams, 1219 Harrison Ave., Cincinnati, Ohio.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

"Established 1884"

GUELPH PATENT CASK CO. Ltd.

Scotstown, Que.

QUALITY *SERVICE*

Our Veneers and Plywood are choice and we are fully equipped to supply the Canadian Trade.

Rotary cut Textile dried

We specialize in 1/4" and 3/16" three ply Birch Panels

Ontario Representative:

Frank Moss P. O. Box 356, **Toronto**

Wide Veneer

One carload of 1/20" Quartered White Oak Sawed Veneer 12" and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.

MEMPHIS, TENN.

VENEER MANUFACTURERS COMPANY

Importers **Manufacturers**

ROTARY CUT VENEERS

FIGURED WOODS

PANELS

Ready for Prompt Shipment

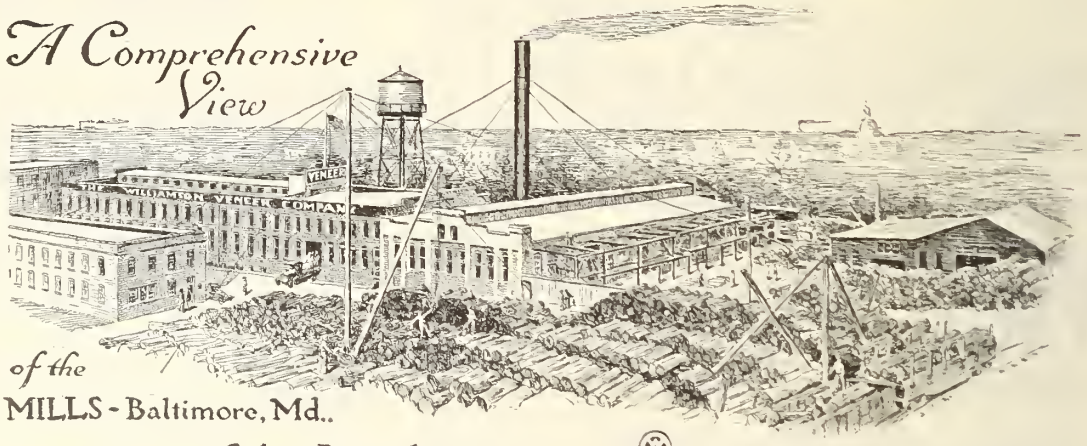
Watch the Veneer and Panel Price Stock Lists.

1036 West 37th Street
CHICAGO, U.S.A.

WE would like to take all of our customers over our plant in Baltimore. We know it would interest them to see *how* we produce QUALITY VENEERS in Walnut Butts, Mahogany, Burls, Long Walnut, Oak, Poplar etc.

A "Personally conducted tour" being out of the question, however, for more than a limited number we will try to give an idea of the plant by means of a series of pictures.

A Comprehensive View



of the
MILLS - Baltimore, Md..

Sales-Branches:
709 - Sixth Ave., NEW YORK CITY,
28 - East Jackson Boulevard, CHICAGO,
JAMESTOWN, N.Y. - HIGH POINT, N.C.

The
WILLIAMSON VENEER CO.

VIEWS OF OUR PLANT No 1.

Definition—

Superior Veneers—(Ve-neers) which by an unexcelled process, every detail of which receives experienced attention are manufactured by WOOD-MOSAIC COMPANY, Louisville, Ky.

Representative,
GEO. W. STONEMAN CO.
CHICAGO, ILL.

Is Balanced Construction the Solution?

(Continued from page 80)

Warping and shrinking may be reduced to a considerable extent by seeing that the stock is held true and flat when dried and that it is dried to the average E.M.C. of the conditions prevailing in the plant. In drying down to this E.M.C. it is a case of where too dry is as bad as not enough. If the E.M.C. in a plant is found to be seven per cent., then all material should be dried to seven per cent. and not lower. If the drying is carried beyond this point the material will pick up moisture which is as bad as giving up moisture as far as warping and twisting is concerned. In other words, to eliminate all movement in our stock we must reduce the drying operation to an exact science based on the average E.M.C. of conditions in the plant.

A Big Contribution to the Industry

No one has done more to develop and popularize the new brown finish for bird's eye maple than C. J. Byrns, general manager of the Bird's Eye Veneer Company, Escanaba, Mich., a firm that, as its name indicates, specializes in the manufacture of high grade bird's eye maple veneer. An article in the last issue of the "Canadian Woodworker" drew attention to the decided trend on the part of furniture manufacturers to use bird's eye maple once more. Already a considerable demand for furniture of this

C. J. Byrns

wood has been noted, the growing popularity being due to some of the new and beautiful brown finishes that have been developed. Bird's eye maple has always been recognized as a fine wood of considerable intrinsic merit and while certain disadvantages have grown up in years past, it seems that these have now been successfully overcome through the development of finishes that are bringing bird's eye into considerable vogue at the present time. How all this has come about forms a very interesting story.

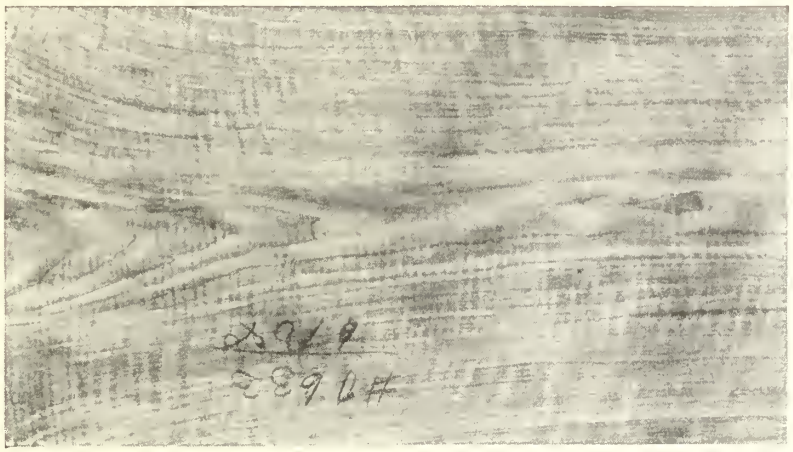
It appears that Mr. Byrns has been keenly interested in the conservation and improved utilization of birch and bird's eye maple. During many years of close observation, he learned that in the manufacture of natural bird's eye maple, much timber was being wasted because large quantities of slightly defective logs were unsuited to the production of the highest grade stock. While these logs were of good figure, they showed small black spots and stains which disqualified them for high grade veneers. Mr. Byrns, after a thorough study of the situation, came to the conclusion that a great deal of this waste was needless and he sincerely felt that much of this timber could be manufactured into quite beautiful and substantial furniture and interior trim. Just how to use these slightly defective logs in this way was a problem that Mr. Byrns tackled with unusual vigor. He consulted with an expert chemist with the result that certain pigments were compounded in certain oils and other liquids to produce an exceptionally handsome brown finish which has been called "BeVeCo Brown Bird's Eye Maple." Reports indicate that this finish has immensely popularized bird's eye maple and increased the demand for furniture manufactured from it. Stock that is slightly defective in any manner need not be wasted but can be cut and transformed, through the use of this new finish, into handsome pieces of furniture of exquisite interior trim.

President of Bird's Eye Veneer Co. Passes Away

The passing of J. C. Kirkpatrick, president of the Bird's Eye Veneer Co., Escanaba, Michigan, removes one of the most widely known men, both in Canada and the northern States, connected with the veneer and panel industry. Mr. Kirkpatrick had been ill for several weeks and the news of his demise was received by his many friends with profound regret. He was in his 61st year. As a youth he came with his parents to Palmer, Mich., where he became connected with his father in conducting the business of the Pittsburgh & Lake Superior Iron Co. In 1881 Mr. Kirkpatrick moved to what is now the village of Whitney, Mich., where he assumed charge of the iron company's lumber business at that point. Since then he has organized several well-known industrial and financial enterprises including the National Pole Co. and the Bird's Eye Veneer Co., both at Escanaba. The latter firm has attained international prominence under the generalship of the late Mr. Kirkpatrick and its product has found its way into the decoration of many Canadian homes by reason of its exceedingly fine texture and the soft and delicate beauty of its figure.

Officers of the Veneer and Panel Mfrs. Association

At the meeting of the National Veneer and Panel Manufacturers' Association, held at the Auditorium Hotel, Chicago, Ill., on December 5 and 6, Harry E. Kline of the Louisville Veneer Mills, Louisville, Ky., was elected president. C. J. Byrns of the Bird's Eye Veneer Co., Escanaba, Mich., was chosen treasurer. H. Brooke Sale is the retiring president.



C.L.WILLEY COMPANY

The Largest Veneer Plant in the World

FLITCHES

TWO HUNDRED years ago a titled Englishman provided in his will that his estate should offer a flitch of bacon once a year to any young couple who, having been married at least a year and a day, could swear that they had never quarreled.

The record is that in these two centuries only ten couples have claimed the flitch.

Yorkshire people, who are notable for their sense of humor, are proud to quote an ancient rhyme which claims a flitch of ham as part of their coat-of-arms. Doubtless this rhyme had its origin in some comical tradition like the story told above.

Flitches of beautifully figured wood are even more important to civilization than flitches of pork.

A saw, a knife, and a flitch of wood could well be the coat-of-arms of C. L. Willey Company, the greatest makers of veneer in the world.

C. L. WILLEY COMPANY

2558 South Robey St., CHICAGO

H. ROBERTSON
Sales Representative
for Michigan
232 Lyon St., N.W.
Grand Rapids, Mich.

W. B. VAN
Eastern
Sales Representative
Everett Hotel,
Jamestown, N.Y.

The Lumber Market

Conditions in the hardwood lumber line are seasonably quiet during December and there are few sales transactions. Manufacturers, wholesalers and large consumers do not care about adding to their stocks beyond the necessary immediate requirements, as they naturally desire to keep down supplies when approaching the inventory period. It is expected, after the furniture and automobile shows are over, which will be toward the end of January, that these heavy consumers will be able to gauge conditions and get a line on how their trade is likely to shape up during the coming twelve months.

The outlook is getting brighter all the while and there are more inquiries for stocks. Millmen, who are taking out a quantity of hardwood, say that a demand is presenting itself on all sides which is quite a different state of affairs to that prevailing twelve months ago. The fall months have shown growing activity, and were it not for the car congestion and embargoes at certain points, distribution would also be on a satisfactory basis.

Stocks are lower now than they have been for some time; there are more requisitions for the lower ends and, with the expected industrial revival, hardwoods should begin to move again at a figure perhaps slightly in advance to which now obtains. Prices all along the line are getting stiffer, especially in the better grades of two-inch and thicker stock.

A good line upon the situation is furnished in a recent interview with a leading manufacturer who says that the stock they are carrying at present is about 40% less than it was a year ago. Logging expenses are about 20% more than last winter owing to the increase in wages.

1923 should be a year of normal activity and steady demand. No one wants to see a runaway market or any other untoward feature which would retard the growing call for hardwoods or undermine the spirit of optimism which now prevails.

Generally speaking, 1922 was a year of softwoods turnover rather than hardwoods, the former being brought about owing to the great building activity in all the larger centres, while the industries that consumed hardwoods were only running on part time schedules. Then most of the building was in the nature of houses, garages, apartments and business blocks rather than industrial extensions and new factories.

Outside of hardwood flooring, the manufacturers of which have been busy for some months, there was not that usual call for hardwoods which is seen when piano, gramophone, furniture, wagon, interior trim and other woodworking plants are operating to capacity. The expected revival in most of these industries is well on the way, and there is no doubt that things are now headed in the right direction and, with patience, perseverence and conservatism, the woodworking and hardwood trades, during 1923, should show a greater measure of turnover, satisfaction and profit than was experienced in 1922.

The box and crating manufacturers are getting to be the largest consumers of lower grades with the result that these are decreasing in supply. Quite a number of big consumers are endeavoring to contract for their requirements extending over the first half of 1923, but manufacturers in most cases do not care to enter into any engagement involving such a long committment.

Information and Inquiries

You are cordially invited to make use of this department

Stock Selling Concerns

Toronto, Ont.,

Editor, "Canadian Woodworker,"

We manufacture a line of wood novelties that is finding a very ready market and we have in mind enlarging our company's facilities and increasing its capital so that a very vigorous sales policy may be adopted with the object of marketing our products on a very large scale. Can you give us the names of any financial firms that may be interested in selling our stock and thus helping us to finance our venture?

Yours very truly,
G. E. L.

There are undoubtedly a large number of firms that will be glad to look into a proposition of your kind and sell the stock if they are satisfied that your venture will be successful. We would mention definitely Anderson, Robinson & Co.; L. M. Green & Co., and Stewart McNair, Reid & Co., all of Toronto.

Floor Lamp Manufacturers

Memphis, Tenn.,

Editor, "Canadian Woodworker,"

We would highly appreciate your furnishing us with a list of Canadian floor lamp manufacturers.

Yours very truly,
M. V.

The following is a partial list of table lamp manufacturers:—Adams, Cruden, Adams Co., Toronto; Art Lamp & Shade Mfg. Co., Montreal; Baetz Bros. Specialty Co., Kitchener, Ont.; Brantford Pattern Works, Brantford, Ont.; Brantford Willow Works Co., Brantford, Ont.; Canada Furniture Manufacturers, Limited, Woodstock, Ont.; Crevier & Fils, Montreal, Que.; Imperial Rattan Co., Goderich, Ont.; North American Furniture Co., Owen Sound, Ont.; J. V. Watson Furniture Co., Kincardine, Ont., and W. E. Whitehead, Toronto, Ont.

Woodenware of Basswood

Basswood is made into articles of woodenware used in the shipment of provisions, such as pails and tubs. It is well liked for such uses, because it is light in weight and odorless, and the light color of the wood makes a good appearance. On account of its good working qualities, it is easy to manufacture into such products. It also has the advantage of showing stenciling extremely well. The light weight of the wood effects a large saving in freight, both when shipped empty to the purchaser and when filled with provisions.

The Sidman Lumber Curing Process

IN

Remodeled or new, Wood, Brick or **Concrete** Buildings.

Fillers and glazes to preserve the building.

The TAG-ROESCH **Automatic** Time-Temperature and **Humidity Controller.**

Three-ply and Du-o-fold Army Duck Curtains, and Hussey Door Carrier Doors.

Automatic Heating, Ventilating and Humidity Systems for Varnish Rooms.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Sidmans AUTOMATIC **Suction System** for returning ALL Condensation DIRECT to the Boiler.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-Down Draught Vent Heads for all purposes.

Cleanable Screen Panel and Window Ventilators.

Roller Bearing (Ott) **Channel Iron** Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and The Sidman Special Hygrometers.

For Description and prices, write

The

Sidmans of Canada

Heating and Ventilating Engineers and Lumber Curing Specialists

LONDON THE S I D M A N L.C.K. Reg Trade Mark **ONTARIO**

"Good Will"

in the ordinary use of the term has a cash value: but—

The Good Will

which radiates at the Christmas Season is not measured by dollars and cents.

We extend ours to all of our friends in the trade.

Canadian General Lumber Company Limited

FOREST PRODUCTS

TORONTO OFFICE:—712-20 Bank of Hamilton Building

Montreal Office: – 514 Canada Cement Co. Building

Mills: Byng Inlet, Ont.

News of the Trade

The American Walnut Furniture Co., Montreal, recently obtained a charter.

The Nagle Upholstering Co., Stratford, Ont., recently suffered a loss of $500 by fire.

The Security Box Co., is a recent registration at Montreal. Jos. M. Laberge is the principal.

The Dougal Varnish Co., Manufacture St., Montreal, are adding one storey, 12 x 35 ft., to their factory.

The Dominion Upholstery & Manufacturing Co., 392 Notre Dame, Winnipeg, is a new concern recently incorporated.

A new factory for the manufacture of auto trucks is in the course of erection by A. H. Wagstaff, 302 Greenwood Ave., Toronto.

McAuliffe Davis Lumber Co. Ltd., Ottawa, Ont., will start work shortly on an addition to their woodworking plant on Chamberlain Ave.

Coulter Wood Products, Ltd., 40 Park Row, Hamilton, Ont., have started the erection of a one-storey drying shed, 20 x 20, at a cost of $1,000.

Scott Lumber Co., Ltd., Port Arthur, Ont., is a new concern with a provincial charter to manufacture and deal in wood products. Capital $50,000.

Radford-Wright-Wilson Co. Ltd., Winnipeg, general woodworkers, have filed application to change their firm name to Radford-Wright Co. Ltd.

The B. C. Manufacturing Company of New Westminister recently shipped 30,000 bundles of fruit box shooks to Australia by the Canadian Highlander.

The Guelph Carriage Top Co. Ltd., Guelph, Ont., have been granted supplementary letters patent to change their name to that of John Mitchell, Ltd.

Brompton Lumber Manufacturing Co. have been granted supplementary letters patent to increase their capital of $249,000, by creating 2,000 shares of 100 each.

Martin Orme, a director of Orme, Limited, Ottawa, manufacturers of pianos, phonographs and other musical instruments, died recently at the age of 31.

The sash and door plant of Jas. Limoges, Terrebonne, Que., was completely destroyed by fire recently, entailing a loss of $50,000. The owner expects to rebuild.

The Eastern Billiard Table Co. Ltd., Montreal, is a new firm recently incorporated, to manufacture and deal in billiard tables and accessories. Capital $50,000.

Cutten & Foster, Church St., Toronto, manufacturers of automobiles, carriage tops, and accessories, are preparing plans for a two storey addition to their plant.

Jos. Creighton Woodworking Co., 701 Central St., London, Ont., recently secured the millwork contract for the new factory of the London Shipping Containers, Ltd.

W. M. Byens Gananoque, Ont., one of the largest stockholders in many of the town's manufacturing plants, including the Ontario Wheel Co., died very suddenly recently.

A recent report from Brantford, Ont., that the National Casket Co., Toronto was preparing to remove to the former city has brought forth a positive denial by the company officials.

Francis & Dane, Ltd., Hamilton, Ont., is a recent incorporation, under provincial charter, with a capital of $200,000, to manufacture wooden cases, trunks and other similar products.

Merritt Bros., basket manufacturers, Grimsby, Ont., have started work on their new warehouse to cost $4,000. The new building will be two storeys, 32 x 45 ft., of frame construction.

The installing of a planing mill is contemplated by Wm. Zurbigg, at Rannoch, Ont. The owner has entrusted J. H. Jameson, St. Mary's, Ont., with the installing and equipping of the plant.

The plant of James Davidson's Sons, Ottawa, Ont., general woodworkers, is expected to close down around Christmas, for three weeks, for the purpose of making necessary repairs.

The Robert Johnston Motor Co. Ltd., Sault Ste. Marie, Ont., have been granted a federal charter to manufacture and market trucks, aeroplanes, water craft, etc., with a capital of $100,000.

Canadian Public Booth Company, Ltd., Ottawa, is a recent incorporation under federal charter, to manufacture and deal in all kinds of furniture and furnishings fittings. Capital $50,000.

The Streetsville Lumber Co., with mill at Streetsville, Ont., and offices at 131 Front St. East, Toronto, Ont., are installing a class D, Sidmon lumber curing kiln to dry their heavy door stock.

Gilbeys Distillery, in Scotland, has recently instructed its Canadian representative to purchase large quantities of box shooks in British Columbia. Hitherto this business was placed in Norway.

Quebec Hardwoods, Ltd., have their offices at 211 McGill St., Montreal. The Company of which Mr. J. W. Harding is managing director, does an export and domestic trade in hardwood.

The box shooks being manufactured in New Westminster, B. C., are finding a ready market in the large Australian cities, Adelaide and Melbourne. Heavy shipments have been made of late.

Paul & Greaves, Verdun, Que., have secured the sash and door contract for apartments on Lasalle Rd. J. P. Dupuis, Ltd., Church Ave., have secured the interior trim contract for the same buildings.

The Grey Furniture Co. Ltd., Neustadt, Ont., have added another storey to their present plant, which is 100 x 60 ft. They are manufacturing medium grade bedroom furniture and a line of library tables.

The new pipe organ for Knox Presbyterian Church Cranbrook, B. C., which is now being installed, was manufactured by Casevant Freres, St. Hyacinthe, Que. The cost of the instrument was $4,000 complete.

Moore Bros., general woodworkers, 23 Wayland Ave., Toronto, are putting in the foundations for their new plant, which they intend moving into about the new year. The building will be one storey, 60 x 75 ft.

A sad accident occurred at the Ball Planing Mills Co., Barrie, Ont., when Fred Glynn, a carpenter, broke his neck when a ladder, on which he was working, collapsed. Deceased leaves a widow and a large family.

Robert Lyons, former manager of the Wood Products Company, Parry Sound, Ont., lost his life in the North Sequin River recently when he broke through the ice when returning from inspecting some game traps.

The Lorne Tractors, Ltd., Tillsonburg., recently leased

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

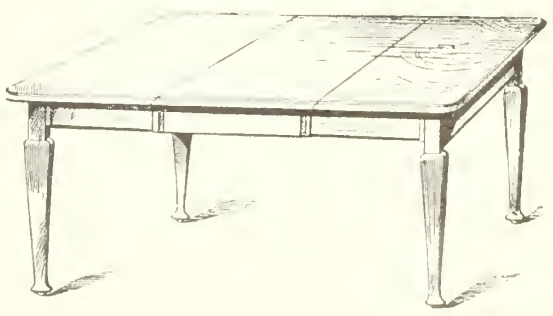
VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

GOOD Plywood is only produced by using first class materials; properly constructed, by careful and skilled workmen.

Our panels are made in this way. Panels in Maple, Birch, Plain Oak, Qrt. Oak, Walnut, Mahogany, Gum, etc., in standard sizes or made to order in quantities.

Flush Veneered Doors in B.C. Fir, Georgia Pine, Plain Oak, Qrt. Oak, etc.



Write for catalogue and prices.

HAY & CO., Limited Woodstock, Ont.

the old power plant owned by Barkey Bros. The firm is making immediate preparations to get under production on fire engines for which there is a large demand.

American Chemical Paint Co., Windsor, Ont., were recently granted a provincial charter to manufacture and deal in paints, oils, polishes and other similar ingredients in the province of Ontario. $40,000 is the authorized capital.

John Bailes & Sons, Ltd., Oshawa, Ont., is a new concern recently incorporated with a provincial charter to manufacture and market trucks, farm implements, flying machines and other similar products. Capital $100,000.

The Gibbard Furniture Company, Limited, Napanee, Ont., are enlarging their plant by a two-storey addition, 60 x 120 feet. They will install a new power plant and put in additional machinery during the winter and spring.

Kenchan Wagon Co. Ltd., Montreal, is a new firm recently incorporated to take over as a going concern the business known as James Kenehan, makers of wagons, carriages, sleighs, trucks and other vehicles. Capital $60,000.

Paragon Products, Ltd., Toronto, were recently incorporated to acquire the firm known as the Paragon Dishwasher's Syndicate of Canada, and to manufacture and deal in washing machines and furniture of all kinds. Capital $750,000.

Stuart Bros. Ltd., Hamilton, Ont., were recently granted a provincial charter to manufacture and deal in sash and doors and other builders supplies. Capital $40,000. Among the incorporators are A. Stuart and J. Stuart, builders, both of Hamilton.

James Carr has started a planing mill business at Allis-ton, Ont., and is ready to manufacture all the milling requirements of the building trade. He intends extending his premises and installing additional machinery to handle the increasing business.

W. G. Quast, manager of the Saskatoon branch of the Knechtel Furniture Co., was a recent visitor to Winnipeg. He states that there is a decided improvement in the West especially so in the larger cities and anticipate big business for the new year.

W. I. Henry, well known lumber merchant, now operating a retail lumber yard and planing mill at Flesherton, Ont., is selling out his interest in this business owing to ill-health. The concern has done very well and at present is enjoying a splendid business.

W. D. Patchell, of Midland, Ont., has recently opened a factory for the manufacture of wood specialties of all descriptions. It is well equipped with the necessary machinery and Mr. Patchell, who is well-known to the trade, states that business is very good.

Chappells, Limited, Sydney, N.S., are considering the installation of some new machinery, in particular equipment for the manufacture of hardwood flooring, which will be a new product for them. They are also thinking of putting in a new endless belt or drum sander.

J. P. Abel Fortin, Limited, Montreal, have added a few machines to their wooden box plant and are commencing the erection of another warehouse. They are specializing on doors and trims of British Columbia fir and are planning to increase their output in these lines.

The Beattie Automatic Phonograph Co. Ltd., Youge St. Arcade, Toronto, were recently granted a charter with $500,-000 capital, to manufacture and market phonographs. Location of their new plant has not yet been decided. The managing director is Geo. B. Beattie, Toronto.

The English Lake Lumber Co., Lake Frontin, Que., is a new company incorporated to take over the mills and limits of Murray & Gregory, Limited. St. John, N. B. The new company will erect a large plant for the manufacture of tubs, pails and boxes for the American market.

At the annual meeting of the Cockshutt Plow Co., Brantford, Ont., the following officers were elected: President, His Hon. Col. Harry Cockshutt; first vice-president and general manager, E. A. Mott; second vice-president and works manager, G. K. Wedlake; secretary, E. Sweet.

The Gold Medal Furniture Manufacturing Co. Ltd., Toronto, have taken over the " Farabed" for Canada and expect to find a large market for it. Comfort, adaptability and strength are said to be features of the new bed. Various grades of mattresses are supplied to fit the bed.

Puddicombe-Irvine, Limited, Toronto, is a new company with a provincial charter to manufacture and market motor boats, motor cars, flying machines and other conveyances. Capital $100,000. Two of the incorporators are, R. M. Puddicombe and R. A. Irvine, both of Toronto.

The Border Cities Casket Co. Ltd., Ford City, Ont., is a new company recently incorporated to manufacture and market caskets, cabinets and all kinds of furniture. Capital $40,000. Two of the incorporators are Charles De Saubier, manufacturer and T. Mogillo, cabinet maker, both of Ford City.

The rapidly growing business of Paul Bros., of Shelburne, Ont., operating a retail lumber yard and planing mill, has compelled them to extend their premises. Their planing mill will be enlarged and additional machinery installed, these increased facilities to be ready by February 1, 1923.

At a meeting of the creditors of Panels Ltd., which company recently made an assignment, a settlement was affected and the company was reorganized as the Southampton Plywood Works, Ltd. The office at Toronto has been closed and in future the affairs of the firm will be carried on at Southampton, Ont.

The R. L. Cushing Millwork Co., Ltd., Moose Jaw, Sask., have added a lumber yard to their premises and are now retailing lumber. A shavings exhaust system has also been installed in their plant, this comprising a 50-in. fan manufactured by the Canadian Blower & Forge Co., Ltd., of Kitchener, Ont.

The Doherty Piano Company, at Clinton, Ont., have made a change in their power equipment. In future they will run their machinery by electric power, supplied by the local Hydro commission, leaving the steam plant for dry kilns and reserve power. This industry is one of the mainstays of Clinton.

Wood Hydraulic Hoist & Body Co. Ltd., Windsor Ont., have been granted a federal charter to take over the business known as Wood Hydraulic Hoist & Body Co. and to manufacture and market all kinds of wooden boats. Two of the incorporators are G. A. Wood, of Algonac, Mich., and L. S. Wood, of Detroit.

The Montreal Harbor Commissioners recently saved $68,-750 by the use of the Panama Canal. Two shipments of lumber, aggregating 5,000,000 feet of Douglas fir, were taken half way around the world for $16 a thousand feet board measure, while the Canadian Railway rate at present is about $29.75 per thousand feet.

Mr. W. H. Slight, Stayner, Ont., well-known to the lumber trade, has recently purchased the interests of Messrs. Robinson & Dobson, consisting of a retail lumber yard and planing mill. He will continue in the business and expects to bring the plant thoroughly up-to-date for the manufacture of sash, flooring, moulding, etc.

Jos. Carr has recently started a planing mill and lumber

Uniform Lumber Means Greatest Satisfaction To The User!

You no doubt have experienced the expense, loss of time, and loss of materials, caused by the use of improperly cured, wrongly graded, and carelessly handled hardwood.

Kraetzer-Cured Lumber is absolutely uniform in quality, properly graded, and every board plainly marked, showing the grade. To show our faith in Kraetzer-Cured products, every board is stamped with our brand.

THE KRAETZER-CURED LUMBER CO.

Because of our unusual facilities we control the lumber from the virgin growth to the time it is loaded on the cars and shipped to you.

When you have once used Kraetzer-Cured Lumber you will not be satisfied with the ordinary kind. Read the eight important reasons why Kraetzer-Cured Gum is used by thousands with such satisfactory results. It will give the same results to you.

Kraetzer-Cured Lumber is of the very best quality, carefully handled by all departments. Every step in this process is taken with the idea of producing uniform high grade hardwood that will give maximum service in your hands.

In addition to Kraetzer-Cured Gum, we can furnish Oak, Ash and other Southern Hardwoods.

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorehead, Miss. Leflore, Miss.

You Should Use KRAETZER-CURED GUMWOOD *Because:-*

1. It is STRAIGHT and FLAT, free from the warp and twist usually encountered in untreated stock.
2. It is BRIGHT and will satisfactorily take any finish.
3. It is free from dote or rot—the sap and gums are eliminated by the steaming process, and fermentation and decomposition are thus prevented.
4. Through the elimination of stain and decomposition, it possesses greater strength and longer life.
5. It contains only atmospheric moisture, enabling it to be used for many purposes without kiln drying.
6. When kiln drying is necessary, this can be done in much less time and with more satisfactory results.
7. It is uniform and dependable. One car like another, grade and measurement what it should be—no time wasted in reporting complaints or shortages, no delays or interference with factory schedules because of holding lumber for adjustments.
8. It is the most economical lumber available. It will satisfactorily answer any requirements expected of materially higher priced woods. Join our little army of satisfied users, and just as peace is about to supplant war, let peace of mind take the place of the warfare and worries that usually beset the user of lumber.

We're proud of this product —that's why.

yard, known as the "Bee Hive Planing Mill," at Alliston, Ont. Mr. Carr will carry everything required for the building trade and intends to install additional machinery and extend his premises as soon as circumstances permit. At present he reports business very good.

Montreal Furniture Manufacturing, Ltd., Pointe Aux Trembles, Que., is a new concern with provincial charter to manufacture and sell all kinds of furniture, musical instruments, toys and other wood products. Capital $49,000. Two of the incorporators are C. G. St. Jean and J. V. Gervais, furniture dealers, both of Montreal.

The Renfrew Planing Mill Co., of Renfrew, Ont., are installing a flooring machine and a Sidman class A, progressive type, lumber curing kiln to manufacture a high grade of birch and maple flooring. They are starting off with a capacity of 10 M ft. per day, but expect in a very short time to increase this to 30 M ft. per day.

The Wilson factory at South Bay, N. B., has been operated steadily through the summer and will continue through the winter as usual. Alex. Wilson is the managing director of this industry.

The Blackmore-Hamilton Furniture Co. Ltd., Listowel, Ont., is a new firm recently incorporated to manufacture all kinds of furniture. The personnel of the new concern is president and general manager, N. Blackmore; vice-president, H. Hamilton; secretary-treasurer, R. A. Treleaven, The Board of Directors consists of the above gentlemen and Messrs. T. Burnett, J. H. Blackmore and L. Pfeffer, of Listowel. and N. Bonderick, of Milverton.

A large hardwood deal was recently completed when the E. L. Bruce Co., of Memphis and Little Rock. Tenn., U. S. A. and John Ransom Co., of Nashville, Tenn., took over the plant, stock and good will of the Nashville Hardwood Flooring Co. Change of ownership will not alter the management of the Nashville Hardwood Flooring Co., which has an authorized capital of $1,000,000. It is reported that the Bruce interests own a majority of the stock.

The Stratford Mfg. Co., Stratford, Ont., manufacturers of all kinds of wooden novelties and furniture, do a large export business with South Africa. Mr. Chas A. Moore, president and manager of this company had an interesting experience in Chicago recently in this connection. He was attending an illustrated travel talk on South Africa and was surprised and delighted to see park seats and lawn chairs made by his company in two of of the views.

George W. O'Neill, president and manager of the Risteen Co., Limited, Fredericton, N. B., dropped dead recently at his home in that city. Mr. O'Neill was born in Fredericton 67 years ago and for the past 45 years had been engaged with the Risteen woodworking factory, devoting his attention to the practical work of manufacturing until 21 years ago when he was appointed manager of the plant. Later he was elected president and managing-director. He is survived by his widow, two sons and two daughters.

The Western Manufacturing Co., Ltd., Regina, Sask., have been quite busy of late. They have just been awarded the contract for the seating accommodation and the main altar for the R.C. church at Ponteix; also the seating accommodation for the Masonic Hall at Shaunavon, Sask. They have also completed a contract for the interior trim, sash, doors, frames and stained glass windows for the R.C. church at Rosenheim, Alta. Another contract which has just been completed calls for all exterior frames and trim, all office fittings and seating accommodation, screens, and counters for the dining hall of the new C.P.R. station at Moose Jaw. The frames and trim for the C.P.R. divisional offices at Moose Jaw comprised another contract.

M. M. Wall, secretary and treasurer of the Buffalo Hardwood Lumber Co., Seneca St., Buffalo, N. Y., is associated with a syndicate in the holding of a fine tract of timber in the interior of B. C., about 400 miles east of Vancouver, which they purchased 12 years ago. Mr. Wall announces that this tract of 17,700 acres is about to be opened up and placed on the market. A recent cruise estimated the stand as over 250,000,000 feet of which about 150,000,000 was red cedar and 80,000,000 hemlock and larch. White pine, fir and spruce making up the total.

The Preston Woodworking Machinery Company, Limited, propose next spring to complete an addition of 100 feet square which were started a few years ago, provided that business continues good. This year they have added to their equipment a Bullard 36" vertical boring mill and a 36" Stirk planer. The company state that they are gradually developing their line of ball-bearing machinery. The machines are not altogether new, but are elaborations of the line they already make, so that they are able to offer their customers increased production and quality.

The Regina Sash & Door Co., Ltd., Regina, Sask., have recently erected a new warehouse and office at the corner of Athol St. and Twelfth Ave. This building is of solid brick, one storey high, and measures 100 x 60 ft. It is the first unit of a new plant that is planned to be the future headquarters of the company. The most modern equipment will eventually be installed in the new plant in addition to the present machinery, to take care of the firm's rapidly growing business. The present plant is situated on Angus St. and it is expected that the new premises will be occupied at an early date.

The W. E. Phillips Company, Limited, are now operating their new plant in Oshawa, with a staff of about fifty men. The volume business is satisfactory, being if anything in excess of capacity of the plant. Directors of the company are R. S. McLaughlin, president of General Motors of Canada, Limited, and W. E. Phillips. W. C. Phillips is associated with the company as is in general charge of sales. The plant contains approximately 30,000 ft. of floor space and product covers full range of picture mouldings, picture frames, advertising frames, framed mirrors, small novelties and hand-carved photo frames, etc. They also make a certain quantity of hardwood flooring and interior trim and are now completing installation of a glass department where they will bevel and silver their own mirrors.

The Creighton Woodworking Co., of London, Ont., has had a busy season and reports that the outlook is promising. Early in the year they extended their mill and reorganized their staff and they have now one of the best equipments in Western Ontario and are handling an ever-increasing volume of trade. Joseph Creighton, who is a successful cabinet maker with a long experience in millwork, is handling the shop end and W. H. Hawkins, who is widely known as an architect, is in charge of the outside work, contracting and service departments. The Creighton Woodwork Co. during the past season built eight houses of various designs and one church are at present well on the way with the construction of the new factory of the London Shippers' Containers Corporation. While there may be some lull in operation during the winter months, the Creighton Woodwork Co. are convinced that next spring will witness a revival of activity and they already have several contracts on hand. The company, whose plant is located at 701-709 Central Ave. East, London, specialize in store fronts, office and store interiors, partitions, fittings, shelving, cupboards, etc.

QUALITY **SERVICE**

Prosperity is Coming Fast.

Are you in a position to meet it?

We Can Help You

on the way to do so, if you will use the right kind of Canadian Hardwoods.

The Kind We Sell

The
Kinnon Lumber Co.
LIMITED
454 King St. W. Toronto

We wish to buy the Following Machines

Have you any idle equipment?

Band Saws up to 36".
Trim and Rip Saw Tables.
Swing Saws.
Poney Planers.
Sash Stickers.
Tenon Machines.
Hollow Chisel or Chain Mortisers.
Sash and Door Clamps.
Dowel Machines.
Belt Sanders.
Veneer Presses.
Post Borers.

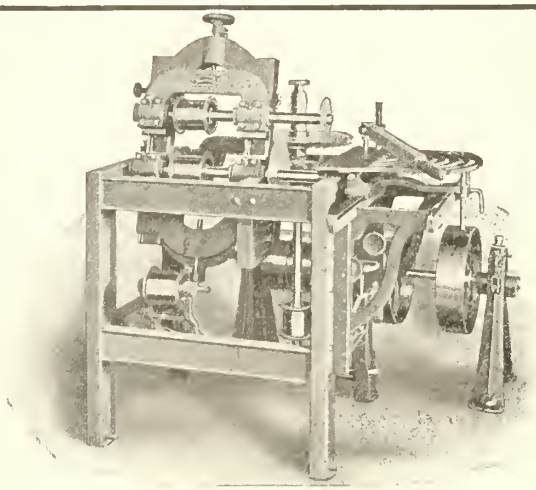
Write us stating lowest cash price F.O.B. cars, and condition of machine.

GENERAL MACHINERY CO.
67-69 Frederick St., TORONTO
TELEPHONE MAIN 2200W

The Peter Hay Knife Co., Ltd.

Manufacture the Best
PLANER KNIVES and CUTTERS
OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited
GALT, ONTARIO



No. 19 Saw Tenoner

Fitted with five saws, has replaced cutter head machines; for all jointing and halving in wood shops and for automobile and carriage wood-work it is the best machine on the market.

Much door, window, sash, furniture and cabinet work is done with this machine where a nice, smooth tenon is required. It is also used for the halving and jointing of stock at any angle.

Tenoners equipped with flexible coupling for direct motor drive or for countershaft.

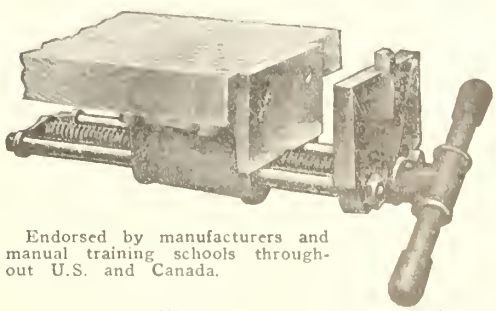
No. 19. Small Saw Tenoner.
No. 20 Large Saw Tenoner.
No. 21 Regular Bevel Saw.
No. 22 Large Bevel Saw.
No. 23 8½ Irregular Dresser.
No. 24 6" Irregular Dresser.

Write for Catalogue.

Pettingell Machine Co.
Amesbury, Mass.
Mention Canadian Woodworker

We also manufacture metal working machines

Quick as a Cat - A Hold like a Bull Dog



No. 430 Rapid Acting Vise for Woodworkers. Quarter turn to left allows front jaw to slide in or out (maximum ten inches.) To tighten simply twist to the right and work is held with a strong firm grip.

Endorsed by manufacturers and manual training schools throughout U.S. and Canada.

No. 430 Vise—Two Sizes with or without stop
UNEQUALLED FOR STRENGTH AND DURABILITY
Our Complete Catalogue on Request
RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT.

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

For Sale

One 52" x 66" Merritt Veneer Lathe.
One 66" Automatic Merritt Veneer Clipper.
All in good condition. Reason for selling too short for their business.
GUELPH PATENT CASK CO. LTD.,
12 Scotstown, Que.

For Sale

2 Mitts & Menill Factory Hogs.
1 Bandsaw Resaw Grinder.
Shingle Mill Machinery.
Wooden Pail & Tub Machinery.
THE C. BECK MFG. CO. LIMITED,
12-2 Penetanguishene, Ont.

Machinery for Sale

1-16"	Buzz Planer (C.M.G.).
1	Chain Mortizer (New Britton).
	Circulator Saw Grinder (Hart Cor.).
3	Head, Hayes sticker 6".
1-30"	Planer knife grinder (Hart Cor.).
1-20"	Drill.
1	Blind Slat Machine (M.C.G.).
1	Door Clamp.
1-36"	Band Saw (Ballantyne).
1	Rivetting Machine High Speed Hammer Co
1	Chain Feed Box Board Matcher (C.M.G.).
1	Sash relisher & Mortiser (C.M.G.).
1 Ft.	Mitering Machine.
1	McGregor Gourlay Tenoning Machine.
1	Knight Jig Saw.
1-75	Horse Power Wheelock Engine.
1	Power Mortiser (McGregor & Gourlay).
1	Swing Saw (Goldie & McCullough).
1	Blind Wiring Machine (McGregor).
1	Planer & Matcher (Clarke & Deening).
1 No.	118 Inside Moulder (Berlin).
1	Veneer Press 6 section of 3 screws each (Francis).
1-4	Head sticker 6" (Greenlie).
1	Saw table (Jackson & Cochrane & Co.)

MACHINERY EQUIPMENT & SUPPLY CO.,
REG'D., 40 Queen St., Montreal. 10-12 E.o.I.

For Sale

One—Used No. 218—30" C.M.G. Heavy Type, Single Cylinder, Cabinet Surfacer, equipped Round Safety Cylinder with High Speed Knives, Sectional Rolls and Chip Breaker —All in splendid condition.
One—Used—28" "MacGregor-Gourlay" Single Cylinder Cabinet Surfacer, with brand new Round Safety Cylinder, also extra Square Cylinder—All in good condition.
One—Used—No. 427 "P. B. Yates" Hand Block Belt Sander, complete with exhaust fan and piping. Equal to new.
One—Used—No. 913 "C.M.C." Double Spindle Horizontal Boring Machine. Equal to new.
One—Used—No. 916 "C.M.C." Single Spindle Vertical Boring Machine. Like new.
One—Used—No. 201 "GREENLEE" Horizontal Hollow Chisel Mortiser. Same as new.
One—Used—No. 478 "GREENLEE" Full Universal Double Arbor Saw Table. Equal to new.
One—New—No. 803 "C.M.C." High Speed Single Spindle Latest Design Shaper.
All the above will be offered at interesting prices, full information also descriptive circulars gladly sent upon request.
Williams & Wilson Ltd.,
84 Inspector St.,
12 Montreal.

For Sale

Maddox Stroke Rubbing Machine, latest model, very cheap, write Cecilian Piano Co., 241 Yonge Street, Toronto.
12

For Sale

A small Planing Mill and Sash and Door factory in St. Catharines. Apply Ed. C. Nicholson & Son, St. Catharines, Ont. 12

Sash and Door Factory for Sale

DUVERNAY STREET, MONTREAL —In the heart of the City, within 100 yards of Lachine Canal and both Railway yards. A two-storey brick encased building, mill construction, containing 21,393 sq. ft. floor space, with 12,000 sq. ft. shed storgae space additional. Light on all sides. Sprinkler system throughout. Dry kiln. Elevators, 2—125 H.P. Leonard H.R.T. Boilers, 150 H.P. Wheellock horizontal steam engine. At present equipped as Sash and Door factory, but suitable for most any manufacturing purpose. For particulars apply to the
ROSS REALTY CO. LIMITED,
Lewis Building, 17 St. John St.,
Montreal 24

GOOD VALUES

Subject to Prior Sale

Band Resaw, Connell & Dengler, 54 and 60 inch.
Band Rip Saw, Yates No. 281.
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 30" and 44".
Dowel Machine, Clement.
Dowel Gluer and Driver, E. B. Hayes.
Jointer, Falls Machine Co. under cut 24".
Jointers, 12", 16", 24".
Jointer, Diehl, Continuous Feed.
Lathe, Back Knife, Clement 40".
Matcher, American No. 229 hardwood.
Matcher, Berlin No. 94, 15" x 6".
Moulder, Woods 10 and 12" inside.
Moulder, American 7" and 10" 4 side.
Planers, all sizes, single and double.
Sander, endless bed, 48" H. B. Smith.
Sander, Moore Machine Co. belt.
Sanders, Berlin 36", 42", 48" and 60".
Sander, Clement Belt roller table.
Saws, Berlin Double Cross Cut.
Woodworking Machinery Co., of Buffalo,
54 Mechanic St.,
Buffalo, N. Y.
10 T.f.

Moscow in Throes of Building Boom

Moscow to-day is passing through a building boom more active than anything of the kind the white-walled city has experienced in several generations.

Real estate improvement has been virtually at a standstill since early in the world war, and after the revolution, which eventually brought the seat of government back to the ancient capital, Moscow became one of the most crowded cities on the face of the earth.

This fall, however, under the Soviet's new economic policy, which permits private enterprise, including leases on property and buildings for 49 years, the rush to gain concessions by local investors began, with German, French and other foreigners also clamoring for privileges. The Government itself also has improved many buildings.

Hundreds of business houses, as well as fine old homes, were so badly damaged during the revolution that it was necessary to rebuild them. Walls of scores of other buildings, ruined by fire, are still standing in various parts of the city, but provision has been made for remodeling most of these next sprng.

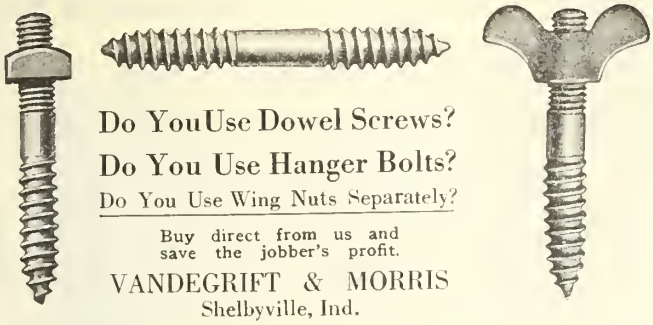
Store space is in great demand, due to the stimulus given by the resumption of free trade, and numerous one-storey affairs have been put up in the shopping districts. They resemble the stores erected in a boom town in Canada or the U.S. Small wooden shacks for the retail selling of books, fruit, clothing and various necessities, have been built temporarily here and there throughout the city, but these will be pushed aside with the resumption of trade through the ordinary channels.

Entire blocks have been cleared for apartment houses, with shop space on the ground floor, and thousands of men and women—usually more women than men—have been employed in this work, carried on with great speed to get as much done as possible before the cold weather begins, when all outdoor tasks of this kind must cease until spring.

To Electrify 30-Mile Section of Vera Crux-Mexico Railway

Contract for the electrification of 30 miles of track on the Mexican Ry. Co. Ltd., between Orizaba and Esperanza on the main line from Mexico City to Vera Crux has been announced by the International General Electric Co. The project calls for the expenditure of between $2,000,000 and $2,500,000 and will be financed through London.

The system will be operated by 3,000-volt direct current which will be supplied by the Pueblo Tramway, Light and Power Co. from hydro-electric plant about five miles from Orizaba. The present contract includes ten 150-ton locomotives, equipment for one sub-station, overhead conductors and accessories. The ruling grade on the electrified section will be 4.7 per cent



Do YouUse Dowel Screws?
Do You Use Hanger Bolts?
Do You Use Wing Nuts Separately?

Buy direct from us and save the jobber's profit.
VANDEGRIFT & MORRIS
Shelbyville, Ind.

ONTARIO HANDLE CO.
411 Manning Chambers
TORONTO
Manufacturers of
BROOM and BRUSH HANDLES
DOWELS and BRUSH BACKS
and SMALL TURNINGS

Subscribers' Information Form

Many letters reach us from subscribers enquiring where certain goods can be obtained. We can usually supply the information. We want to be of service to our subscribers in this way, and we desire to encourage requests for such information. Make use of this form for the purpose.

Date 19

"CANADIAN WOODWORKER"
345 Adelaide St., West, Toronto

Please tell us where we can secure (give description as fully as possible) .....

.....

.....

.....

Name .....

Address .....

NAILS AND WIRE
For Every Need in the Woodworking Industry

Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

Laidlaw Bale-Tie Co., Ltd.

A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

The Door Carrier System

Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.
Ask for catalogue.

DRY KILN
DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

The "Canadian Woodworker" Buyers' Directory

The following regulations apply to all advertisers:—Full page, every issue, thirty-two headings; half page, sixteen headings; quarter page, eight headings; eighth page, four headings.

AIR BRUSH EQUIPMENT
De Vilbiss Mfg. Co. Toledo, Ohio.

BALE TIES
Laidlaw Bale-Tie Co., Hamilton, Ont.

BALL BEARING
Canadian SKF Company, Toronto, Ont.

BALUSTER LATHES
Mattison Machine Works, Rockford, Ill.

BAND SAW FILING MACHINERY
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Co., Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B. Hamilton Ont.

BAND SAWS
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Yates Machine Co., P. B. Hamilton, Ont.

BAND SAW MACHINERY
Yates Machine Co., P. B. Hamilton, Ont.

BAND SAW STRETCHERS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

BASKET MACHINERY
St. Joseph Iron Works, St. Joseph, Mich.

BENCH PLANER
Oliver Machinery Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
McKnight & Sons Co., L. G., Gardner, Mass.

BEVEL & MITRE SAWS
Pettingell Machine Co. Amesbury, Mass.

BIRCH
Anderson, Shreiner & Mawson, Ltd., Toronto
Edward Clark & Sons, Toronto, Ont.
Maus Lumber Co., Chas. O. South Bend, Ind.

BLOWERS
Canadian Blower & Forge Co. Kitchener, Ont.
Sturtevant B. F. & Co., Galt, Ont.

BLOW PIPING
Canadian Blower & Forge Co. Kitchener, Ont.

BORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Sons Co., L. G., Gardner, Mass.
Nash, J. M. Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Yates Machine Co., P. R. Hamilton, Ont.
Valley City Machine Works, Grand Rapids, Mich.

BOX BANDS
Laidlaw Bale-Tie Co., Hamilton, Ont.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Morgan Machine Co., Rochester, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

CABINET PLANERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CARVINGS
Klise Mfg. Co., Grand Rapids, Mich.
Decorators Supply Co., Chicago.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

CARVED WOOD MOULDINGS
Klise Mfg. Co., Grand Rapids, Mich.

CASTERS
Foster, Merriam Co., Merriden, Conn.
National Hardware Co., Orillia, Ont.

CHAIR MACHINERY
McKnight & Sons Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C. Indianapolis, Ind.
Shurly-Dietrich, Galt, Ont.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Batavia Clamp Company, Batavia, N.Y.
Black Bros. Co., Mendola, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Sons Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company,
Taylor Mfg. Co., Jas. L. Poughkeepsie, N.Y.

CLAMP CARRIERS
Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CRATE MACHINERY
St. Joseph Iron Works, St. Joseph, Mich.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D. Guelph, Ont.

CUT OFF SAWS
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Co., of Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rochford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Shimer Cutter Head Co., Galt, Ont..
Yates Machine Co., P. B., Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOORS
Pannill Door Co. Ltd., Toronto, Ont.

DOORS (Flush Veneered)
Hay & Co. Ltd., Woodstock, Ont.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.
Richard-Wilcox Canadian Co., London, Ont.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Wylie & Co., Matthew Glasgow, Scotland

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company,
Ober Mfg. Co., Chagrin Falls, Ohio.
Preston Woodworking Machinery Co., Preston, Ont.
W. S. Hawker Mfg. Co., Dayton, Ohio.

DOWELS
Canada Wood Specialty Co. Ltd., Orillia, Ont.
Rowe Mfg. Co., Newago, Mich.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont.
Cutler Desk Co., Buffalo, N. Y.
Grand Rapids Veneer Works, Grand Rapids, Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.
Sturtevant, B. F. & Co., Galt, Ont.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.
Sturtevant, B. F. & Co., Galt, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

DYNAMOS
Industrial Engineering Co., Toronto, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

EDGER SAWS
Atkins & Co., E. C. Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

ELECTRIC MOTORS
Sturtevant, B. F. & Co., Galt, Ont.

ENAMELS
Cosmos Chemical Co., Port Hope, Ont.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST HEADS
Sturtevant, B. F. & Co., Galt, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Sturtevant, B. F. & Co., Galt, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co., Kitchener, Ont.
Sturtevant, B. F. & Co., Galt, Ont.

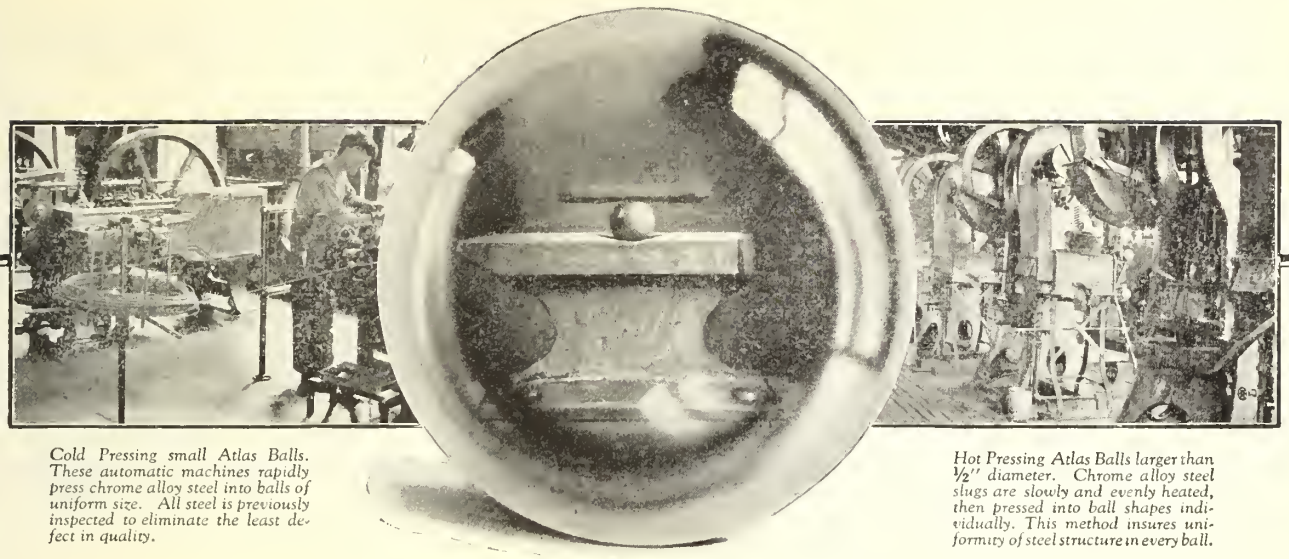
FEED ROLLS
Atkins & Co., E. C. Hamilton, Ont.

FIRE DOORS
Richards-Wilcox Canadian Co., London, Ont.

FIBRE PRODUCTS
Carter, E. T. Toronto, Ont.
National Patent Reed Sales Co., Philadelphia, Pa.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

FRUIT PACKAGE MACHINERY
St. Joseph Iron Works, St. Joseph, Mich.



Cold Pressing small Atlas Balls. These automatic machines rapidly press chrome alloy steel into balls of uniform size. All steel is previously inspected to eliminate the least defect in quality.

Hot Pressing Atlas Balls larger than ½" diameter. Chrome alloy steel slugs are slowly and evenly heated, then pressed into ball shapes individually. This method insures uniformity of steel structure in every ball.

12 Tons of Crushing Weight Failed to Fracture This Ball

This mighty blow struck an ordinary half-inch Atlas Steel Ball — and the only happening of consequence was the sinking of the ball into the anvil top.

What *did not* happen to the ball bears mute evidence of the quality of the steel, and its heat treatment.

Exceedingly hard, tough and durable, the chrome alloy steel used in Atlas Balls affords remarkable resistance to the severest blow, shock, or pressure which commercial usage may apply.

Every ½" Atlas O. K. Ball will withstand over 12 tons pressure before fracturing—1" ball approximately 43 tons —1½" balls 70 tons. These are loads far in excess of those met in actual service.

For years Atlas Balls have had the quality approval of the bearing industry and of industrial concerns which demand balls of extreme accuracy and strength.

CANADIAN SKF COMPANY, LIMITED
Toronto - Montreal

726

ATLAS STEEL BALLS

Made Under
SKF
Supervision

"Canadian Woodworker" Buyers' Directory—Continued

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N. Y.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

FIRE INSURANCE
Canadian Appraisal Co. Ltd., Montreal, Que.
Dominion Appraisal Co., Toronto, Ont.

FURNITURE TRIMMINGS
Larsen & Shaw Ltd., Walkerton, Ont.

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.

GLUE
Canada Glue Co., Brantford, Ont.
Cannon Canadian Co., Toronto, Ont.
Coignet Chemical Products Co., New York, N.Y.
Kane Manufacturing Co., Chicago, Ill.
Monite Waterproof Glue Co., Minneapolis, Minn.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Taylor Mfg. Co., Jas. L. Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

Grinders (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.

GROOVERS
Atkins & Co., E. C. Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Mattison Machine Works, Rochford, Ill.

GUM LUMBER
Anderson-Tully Co., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W. Va.

HAIR (Curled)
Blocksom & Co., Michigan City, Ind.

HAND SCREWS
Fay & Egan Co., J. A. Cincinnati. Ohio.

HANDLE & SPOKE MACHINERY
Fay & Egan Co., J. A. Cincinnati. Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rochford, Ill.
Nash, J. M., Milwaukee, Wis.

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.
National Hardware Co., Orillia, Ont.
Richards-Wilcox Canadian Co., London, Ont.
Larsen & Shaw Ltd., Walkerton, Ont.

HARDWOOD LUMBER
Anderson, Shreiner & Mawson, Toronto, Ont.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr-Holaday Lumber Co., Greenfield, Ohio.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Clark, Edward & Sons, Toronto, Ont.
Canadian General Lumber Co., Toronto, Ont.
Dudley Lumber Co. Inc., Memphis, Tenn.
Farrin Lumber Co., M. B., Cincinnati, Ohio
Gulf Lumber & Trading Co., New Orleans, La.
Hafner Manufacturing Co., St. Louis, Mo.
Hyde Lumber Co., South Bend, Ind.
Johnston Lumber Co., Toronto, Ont.
Kinnon Lumber Co. Ltd., Toronto, Ont.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
Maus, Lumher Co., Chas. O. South Bend, Ind.
May Hardwood Co., R. R. Louisville, Ky.
Memphis Band Mill Co., Memphis, Tenn.
Merceau-Hawkins Tie Co., Huntington, W. Va.
Mowbray & Robinson, Cincinnati, Ohio.
Otis Mfg. Co., New Orleans, La.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Walnut Co., St. Louis, Mo.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Sullivan, Frank T. Buffalo, N. Y.
Wood Mosaic Co., Louisville, Ky.
Willey Co., C. L. Chicago, Ill.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

Knobs
Waddell Mfg. Co., Grand Rapids, Mich.

LACQUERS
Cosmos Chemical Co., Port Hope, Ont.
Celluloid Zapon Co., New York, N. Y.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rochford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

LEGS
Klise Manufacturing Co., Grand Rapids, Mich.

LUMBER DRY KILNS
Sturtevant, B. F. & Co., Galt, Ont.

MACHINE KNIVES
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Yates Machine Co., P. B., Hamilton, Ont.

MITRE SAWS
Atkins & Co., E. C. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati. Ohio.
McKenzie Machinery Co. D. Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.

MONOGRAM FANS
Sturtevant, B. F. & Co., Galt, Ont.

MOTORS
Industrial Engineering Co., Toronto, Ont.
Sturtevant, B. F. & Co., Galt, Ont.

MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati. Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N. Y.
Wylie & Co., Matthew Glasgow, Scotland
Yates Machine Co., P. B., Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PAINT
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Calhoun Plywood Co., Sheboyan, Wis.
Hardwood Products Co., Neenah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rochford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRAND RAPIDS

Carborundum Brand Garnet Paper and Cloth in the Woodworking Centers of America

GRAND RAPIDS!
In 1833 the site of an abandoned Indian village—in 1850 a chartered city—and now the greatest, high-grade furniture center of America.

Grand Rapids is a great proving ground for garnet paper and cloth. There they have some of the largest, some of the most noted producers of furniture in the whole, wide world. In these plants are men who are masters of their craft.

These are the men who realize the true value of good garnet paper and cloth.

And frankly, that is the reason why so many of them favor and use Carborundum Brand Garnet Products. You will find them in practically every Grand Rapids plant, big or little.

They have earned their way in Grand Rapids because, first of all they are coated with North River Garnet—there is none better.

Secondly, because they are made right—made to cut clean and to give a smooth, uniform finish and to give production, in keeping with economy.

You have only to try Carborundum Brand Garnet in rolls, belts or finishing sheets to know why they use it in Grand Rapids—and every other big woodworking center.

CARBORUNDUM BRAND GARNET PRODUCTS
MAKE GOOD SANDERS BETTER SANDERS

The Carborundum Company, Niagara Falls, N. Y., U. S. A.

Grand Rapids, New York, Chicago, Philadelphia, Boston, Detroit, Cleveland, Cincinnati, Pittsburgh, Milwaukee

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co.. P. B., Hamilton, Ont.

PLYWOOD
American Plywood Corporation, New London, Wis.
Bury, Robt. & Co. (Can.) Ltd., Toronto, Ont.
Calhoun Plywood Co., Sheboygan, Wis.
Guelph Patent Cask Co., Scotstown, P. Q.
Hay & Co. Ltd., Woodstock, Ont.
Wisconsin Veneer Co., Rhinelander, Wis.

PERIOD MOULDINGS
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter, E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

REVERSIBLE PLANING MILL FANS
Sturtevant, B. F. & Co., Galt, Ont.

RIM AND FOLLOE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
McKenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Klise Manufacturing Co., Grand Rapids, Mich.
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Wylie & Co., Matthew Glasgow, Scotland
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPERS
Behr & Co.. Herman, Brooklyn, N. Y.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SATINWOOD
Willey Co., C. L., Chicago, Ill.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P. Q.

SAW FILING MACHINERY
American Saw Filing Machine Co., Boston, Mass.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
McKenzie Machinery Co., D., Guelph, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

SAW TENONERS
Pettingell Machine Co., Amesbury, Mass.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Shurly-Dietrich, Galt, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHELLAC
Kasebier-Chatfield Shellac Co.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Preston Woodworking Machinery Company, Preston, Ont.

SLOW SPEED PLANING MILL EXHAUSTERS
Sturtevant, B. F. & Co., Galt, Ont.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

STEAM ENGINES
Sturtevant, B. F. & Co., Galt, Ont.

STEAM TURBINES
Sturtevant, B. F. & Co., Galt, Ont.

STEEL PLATE PLANING MILL EXHAUST
Sturtevant, B. F. & Co., Galt, Ont.

STEEL PRESSURE BLOWERS
Sturtevant, B. F. & Co., Galt, Ont.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Shurly-Dietrich, Galt, Ont.
Simonds Canada Saw Co., Montreal, P. Q.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Bruce Woodworkers Ltd., Chesley, Ont.
Walter & Company, B., Wabash, Ind.
Watertown Table Slide Co., Watertown, Wis.

TEMPERATURE REGULATORS
Canadian Powers Regulators Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.
Hay & Co. Ltd., Woodstock, Ont.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

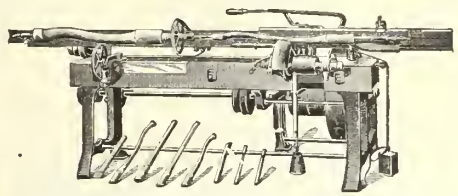
TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

TURBINES
Sturtevant, B. F. & Co., Galt, Ont.

TURBO UNDERGRATE BLOWERS
Sturtevant, B. F. & Co., Galt, Ont.

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet Pick Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.

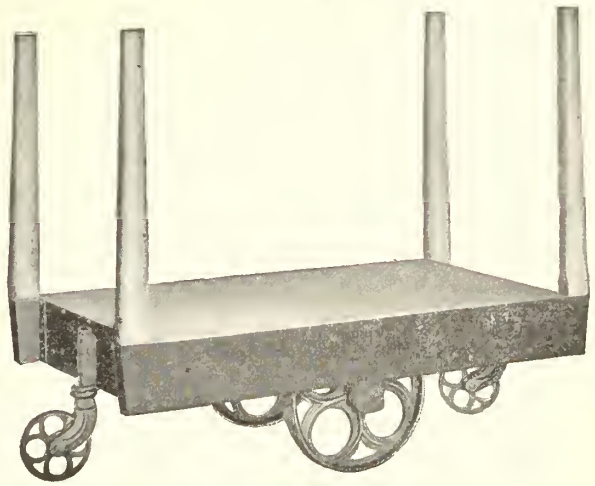
We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY

Klotz Machine Co.,
Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

NOW IS THE TIME



To Cut Your Production Cost by Using

"GLOBE"

ALL STEEL FACTORY TRUCKS

Made in 3 sizes:

24" x 52" 28" x 58" 34" x 70"

Globe Vise & Truck Co.

GRAND RAPIDS, MICH.

The Canadian Appraisal Co. Limited

The Pioneer Appraisal Organization of Canada

Established 1905

"An adjustment of fire insurance in accordance with existing values is a universal necessity. Many people who now believe that they are properly covered against the fire risk are, in reality, inadequately covered. Morever, realization of these facts is by no means general."

The Chronicle

Over 85% of the appraisals made during the past fifteen years of Canadian manufacturing and industrial properties have been carried out by us, aggregating some 5.000. properties, and include over 250 lumber and woodworking plants.

Correspondence invited

TORONTO
Royal Bank Building

MONTREAL
364 University Street

Dominion Appraisal Company Limited

The Test of An Appraisal

"We have never been so grateful for anything we have done as for the appraisal made by you in December 1919. It certainly was worth thousands of dollars to us in the adjustment of the fire."

Port Arthur Daily News Limited
May 5th, 1921

Our staff of qualified appraisers—men with many years experience in the appraisal field—and our system of careful supervision of all work entrusted to our care has afforded protection to our large clientel extending throughout the Dominion of Canada.

We solicit your correspondence

8-10 Wellington Street East
TORONTO, ONT.
Telephone Main 646.

"Canadian Woodworker" Buyers' Directory—Continued

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Klise Manufacturing Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

TWIST WORK
Klise Manufacturing Co., Grand Rapids, Mich.

UPHOLSTERY
Oriental Textiles Co., Oshawa, Ont.

UNDERGRATE BLOWERS
Sturtevant, B. F. & Co., Galt, Ont.

UNIT HEATERS
Sturtevant, B. F. & Co., Galt, Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N. Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Company, Robert, Toronto, Ont.
Guelph Patent Cask Co., Scotstown, P. Q.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mohawk Veneer Co., Warren, Pa.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Standard Veneer Co., Portland, Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N. Y., High Point, N. C.
Wisconsin Veneer Co., Rhinelander, Wis.
Willey Co., C. L., Chicago, Ill.
Wood Mosaic Co., Louisville, Ky.

VENEER CLIPPERS
St. Joseph Iron Works, St. Joseph, Mich.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.
Shurly-Dietrich, Galt, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.

VENEER JOINTERS
Preston Woodworking Machinery Company, Preston, Ont.

VENEER MACHINERY
Preston Woodworking Machinery Company, Preston, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

VENEER LATHES
St. Joseph Iron Works, St. Joseph, Mich.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Richards-Wilcox Canadian Co., London, Ont.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Des Moines Sawmill Co., Des Moines, Iowa.
Maus Lumber Co., Chas. O. South Bend, Ind.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Walnut Company, St. Louis.
Sullivan, Frank T., Buffalo, N. Y.

WASTE
Carter, E. T., Toronto, Ont.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

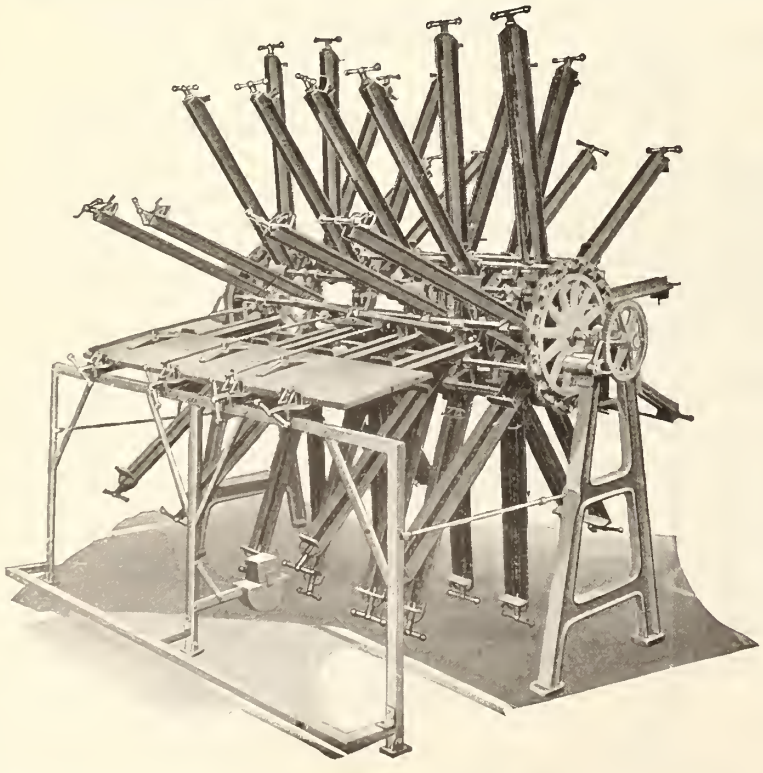
WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Pettingell Machine Co., Amesbury, Mass.

WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

Speed + Perfect Joints = Low Costs



REG. U.S. PAT. OFF.
The Taylor TRADE MARK

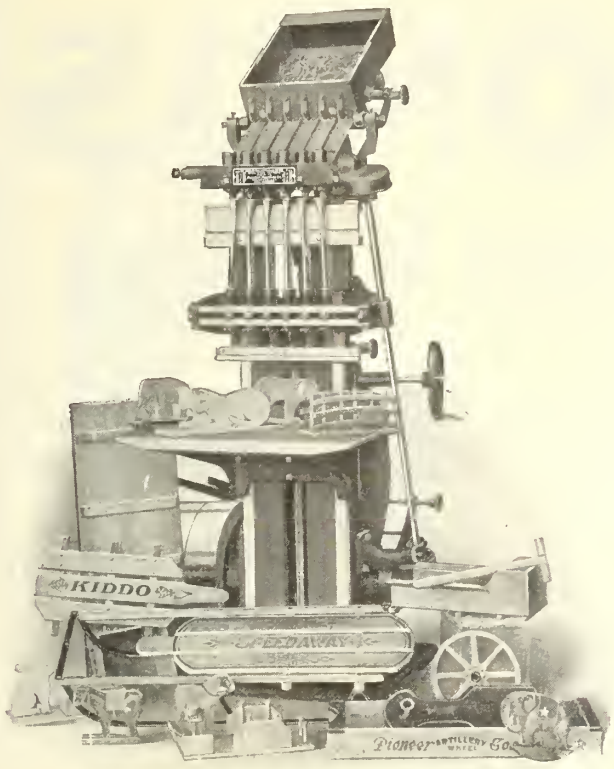
CLAMP CARRIER
for
Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.



Morgan No. 6 Nailing Machine

MORGAN
NAILING MACHINES

Used in Nailing Wooden Toys

Many manufacturers of American Wooden Toys use our machines for driving 5/8" to 1 1/8" nails. Machines are adjustable in operation and can be adapted to any kind of nailing work.

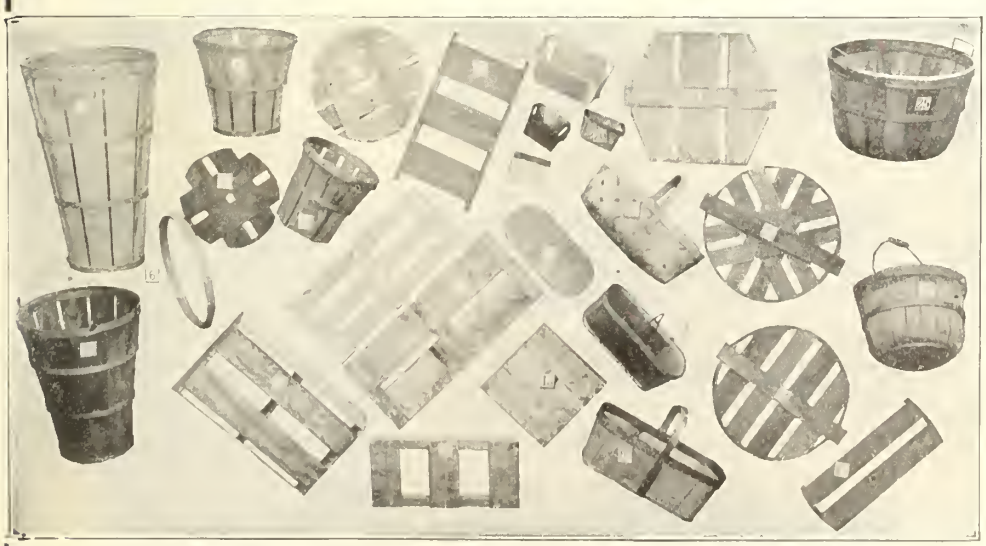
If you are driving nails by hand, in making boxes, crates, toys, any woodenware articles, figure the cost. It is expensive.

Then send us samples of your work. Get an estimate of the cost of nailing on a Morgan Nailing Machine. Compare the figures. We'll leave the rest to your judgment.

Send us your nailing problems. We shall be pleased to give them our careful consideration and advise you regarding equipment for handling them. We invite your inquiry.

Morgan Machine Company
Rochester, N. Y.

THIS IS THE NAME



of the Machinery for the Rapid Production of

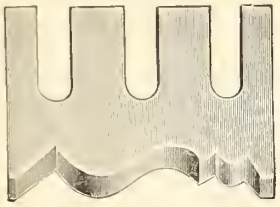
Veneer—Crates—Baskets—Fruit Packages.

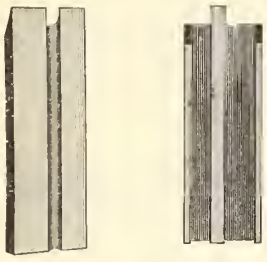
"St Joe"

Get the name fixed in your mind.

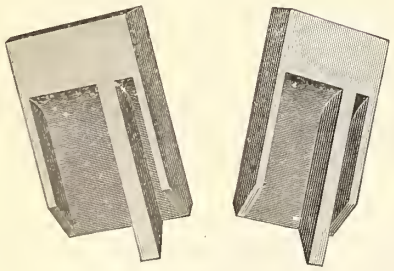
ST. JOSEPH IRON WORKS, St. Joseph, Michigan

SIMONDS
Machine Knives



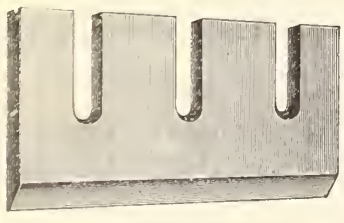


Woodworking shops, the machines of which are equipped with Simonds Knives are getting greater production and longer knife service. The high-grade steel of which Simonds Knives are made is tempered by a scientific method to hold its cutting edge longer and withstand wear.



Every kind of machine knife, as well as Saws which are required in the woodworking industry are produced in one of the five Simonds factories.

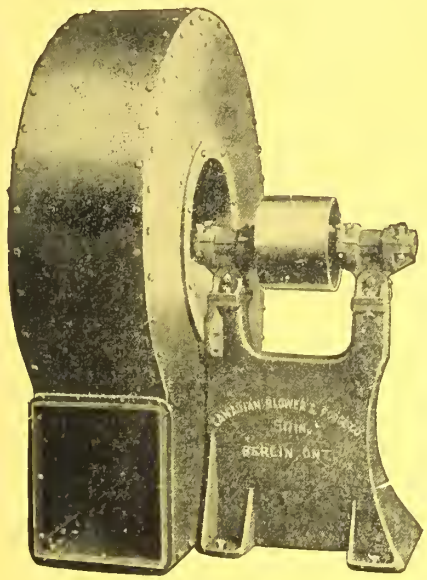
When you require knives send us your inquiries.



Simonds Canada Saw Co., Ltd.

MONTREAL, QUE.

ST. JOHN, N.B. VANCOUVER, B.C.



Canadian Planing Mill Exhauster

Keep your shop clean, remove your sawdust, shavings, or other loose material.

A clean shop with machines free from shavings, chips or sawdust makes for greater efficiency.

Let our engineering department help you plan your refuse exhaust system.

Write for Catalogue 400-13

Canadian Blower & Forge Co.

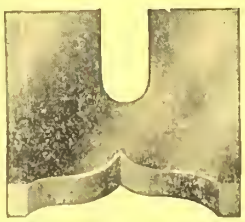
Kitchener, Ont.

Montreal, Toronto, Winnipeg, Calgary, Vancouver, St. John

ATKINS

STERLING QUALITY

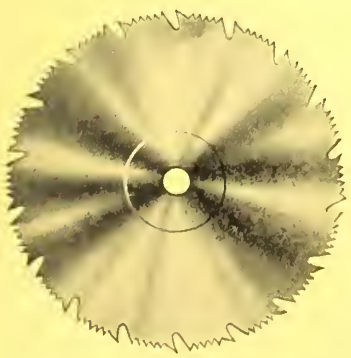
SAWS and KNIVES ECONOMIZE



ARE your saws and knives wasting your lumber? If so, why not turn that waste into a profit by installing

Atkins Sterling Quality Saws

and Machine Knives



Some of the largest woodworking mills in the country are using Atkins Saws exclusively, because they increase production, stop waste and make a name for themselves wherever they go.

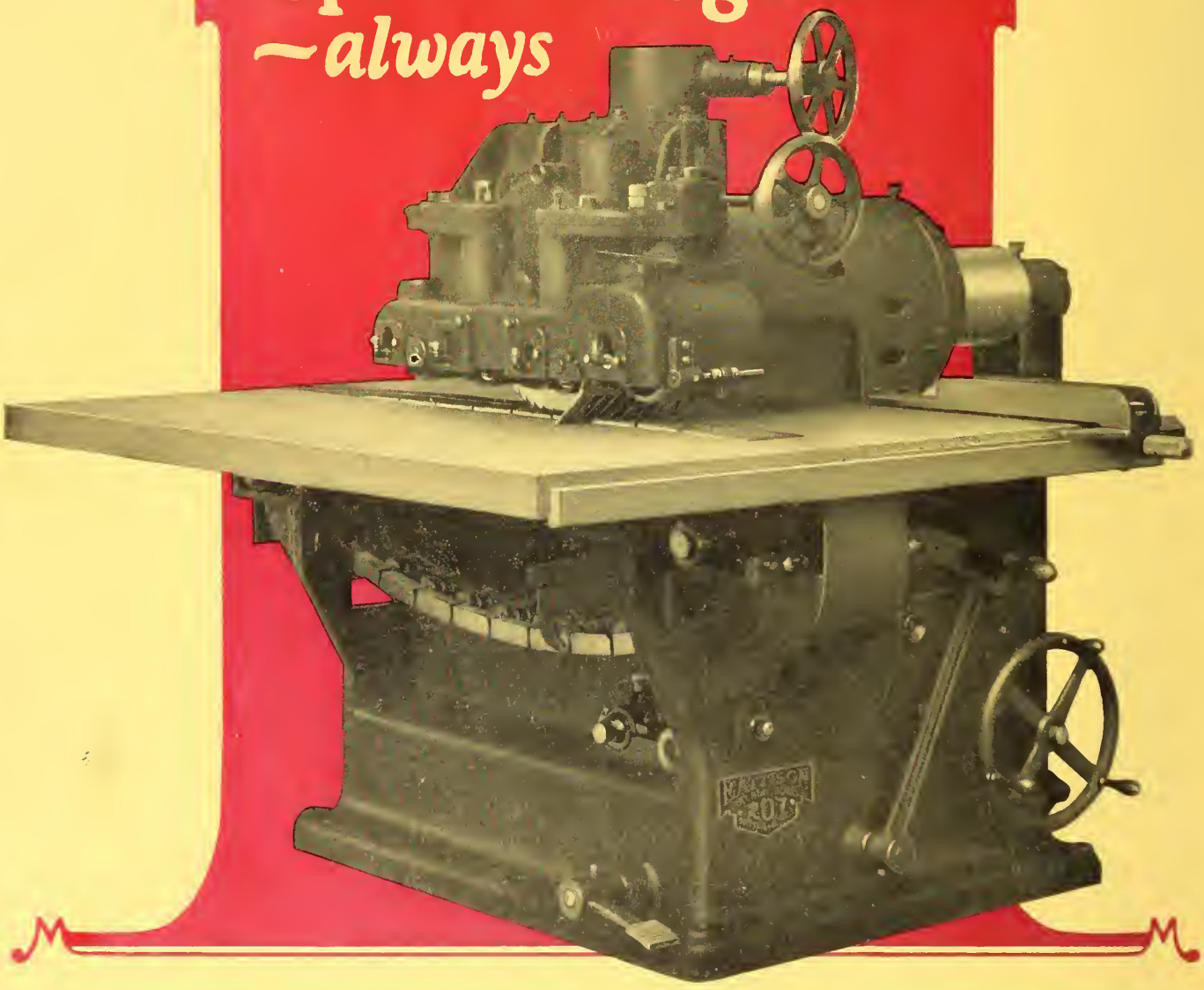
Write to-day for our Knife Booklet "C.W." and Pattern Template Paper.

E.C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

Rips in a Straight Line —always



The Ball Bearing Mattison Ripper

Further refinement in the design and construction of the Mattison Chain Feed Rip Saw greatly adds to its utility.

High-garde ball bearings, both for the saw arbor and the feed rolls, overcome friction and vibration, and assure a free-running saw which permanently remains in perfect alignment.

Wherever there is the slightest chance for wear, throughout the feed-works, the traveling chain and elsewhere, this machine is provided with simple, put positive, take-up devices.

Being able to compensate for wear is one of the reasons why the Mattison Ripper can be absolutely depended upon for accurate, straight-line ripping through years and years of hard service.

Our design provides for a compact built-in motor drive. The motor does not overhang, but is housed within the column which supports the feed-works.

Competitive tests prove this New Mattison Ball Bearing Rip Saw superior in operating convenience, quality ripping and mechanical excellence.

MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.